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A Nontimber Forest Products Bibliography Emphasizing Central Africa.

With support from the
USAID Central Africa Program for the Environment



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UNITED STATES
DEPARTMENT OF
AGRICULTURE



FOREST SERVICE
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A Nontimber Forest Products Bibliography: Emphasis on Central Africa.

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Acknowledgments

Mark Buccowich, USDA Forest Service deserves recognition for conceiving of and initiating this bibliography.

David Wilkie and Terry Sunderland stand out as researchers whose advice and support was instrumental in producing a useful document.

I would also like to thank the many researchers and professionals that provided documents and supportive feedback as we assembled this document.

Please note that, despite this wonderful support, any errors in the bibliography are wholly my responsibility.

Peter Maille
Compiler

Introduction

Purpose

This bibliography is meant to facilitate nontimber forest product (NTFP) work in central Africa by 1) helping people locate information and 2) providing people with the information directly, when possible. Because needs vary, the documents in this bibliography reflect a variety of approaches and topics. There are documents directly related to many aspects of central African NTFP's. There are also papers on other regions when the topic was relevant or the paper filled a gap in the central African literature. There is also a scattering of NTFP background pieces. Our hope is that anyone working on NTFP's in central Africa will find this mixture of information supportive and stimulating.

How to Use this Bibliography

To locate information on a given topic using this bibliography.

- You can scan through the references section. This section is a listing of documents, sorted alphabetically by author and date. Each of these references includes a title, abstract and/or note, and a list of keywords. Many abstracts contain direct quotations from the referenced documents. For documents lacking an abstract, we provide a description of the content under the heading of "Note." The keyword list is generated by automatic searches of the title, abstract, and notes for designated words.
- Alternatively, a user can scan the "Index of Keywords" in section 2. This relates keywords to the documents in which they are found and provides a quick way of locating documents that cite a given keyword. The index does not cross-reference synonyms so you may find that you need to look for different versions of a given keyword; for example, "hunting" and "*chasse*" or "bush mango" and "*Irvingia*."
- If you are using the Internet version of this bibliography, you can make use of the hyperlinks to access the publisher of a given document or, sometimes, the document itself. When looking up

these documents on the Internet, you should know that the “location” of a document often changes when an organization changes its website. If your attempt to locate the document fails, you can try to step back through the organization’s website by deleting the portion of the address on the right end. For example, if a search on <http://www.ecofac.org/Canopee/N12/> returns an error message, then try <http://www.ecofac.org/Canopee/>

If this fails, try <http://www.ecofac.org/>

Repeat searches like this can sometimes let you establish a connection with the organization and successfully locate the document in question. You can also use these addresses to search within an organization for other documents. For example, connected to www.ecofac.org, searching and browsing may turn up useful reports not in this bibliography.

Finally, there is a “Directory of Contact Information” to help contact the source of a given document.

Resource List

Acharya, K. 1998. Prostate Demand Stips Curative Trees. *The EnviroNews Service*. 1998 March.

Keywords: demand/overexploitation/Prunus/*Prunus africana*

Web/URL's: <http://www.envirolink.org/archives/enews/0721.html>

Notes: This article provides a short description of the threat to *Prunus africana*.

Ada Ndoutoume, E. 1997. Etude des Produits Forestiers Non-Ligneux Alimentaires du Gabon. Libreville, PAFT-Gabon. 9 p.

Keywords: alimentaires/food/Gabon/usages coutumiers

Notes: This report includes a simplified description of NTFP's used for food and a short discussion of the current forestry code as it relates to NTFP use. Annexes include a listing of "plantes alimentaires spontanées" that were cited in the report and two pages of legal code entitled "réglementant l'exercice des droits d'usages coutumiers."

Adjanooun, E.; Mourambou, I.; Mve-Mengome, E.; Nguema, M.G.; Ollome, J.B.; and Sita P. 1986. Contribution aux études ethnobotaniques et floristiques au Gabon. Collection Médecine traditionnelle et pharmacopée. Paris: Agence de Coopération Culturelle et Technique. 294 p.

Keywords: collection/Gabon/pharmacopée

African Rattan Research Programme, Programme de Recherche des Rotins d'Afrique website. Hosted by African Rattan Research Programme, Kew, Richmond, UK.

Web/URL's: <http://www.africanrattanresearch.fsnet.co.uk/>

Contact/Web Master: afirrattan@aol.com

Keywords: bibliography/Cameroon/Certification/conservation/Côte d'Ivoire/ecology/Equatorial Guinea/fruits/Gabon/Ghana/international trade/inventory/Laccosperma/*Laccosperma secundiflorum*/Limbe/market/rattan/research/rotin/rotins/sustainability/trade/website/taxonomy

Abstract: Excerpted from the home page: “Rattans are climbing palms (Palmae: Calamoideae), characterised by their scaly fruits. The flexible stems of rattan are utilized in the manufacture of furniture, baskets and other woven products and contribute to a growing international trade currently worth some US\$6.5 billion per annum. Although the majority of the 650 species of rattan occur in SE Asia, four genera, represented by 18 species, also occur in the lowland tropical forests of West and Central Africa. Like those of SE Asia, the rattans of Africa are widely utilized, forming the basis of a thriving cottage industry and playing a major role in indigenous subsistence strategies. In recent years, many calls have been made to promote and develop the African rattan resource, a high-value nontimber forest product (NTFP), to promote the paradigm of conservation through sustainable forest utilisation. However, until very recently, even the most basic knowledge of the taxonomy, ecology and utilisation of the African rattan resource was largely unavailable.

“To provide this essential baseline information, the African Rattan Research Program (ARRP) a multi-disciplinary initiative of the Royal Botanic Gardens, Kew, and University College, London was launched in 1997. The Program’s goal is to undertake a regional (West and Central Africa) survey of the biology, distribution and utilisation of African rattans to assess their role in indigenous management systems as well as their potential to contribute to the thriving world export market.”

Notes: This website has hyperlinks to a number of recent rattan research reports including an extensive annotated bibliography.

Aké Assi, L.; Abeye, J.; Guinko, S.; Giguët, R.; and Bangavou, X. 1992. Contribution aux études ethnobotaniques et floristiques en République Centrafricaine. Collection Médecine traditionnelle et pharmacopée. Paris: Agence de Coopération Culturelle et Technique.

Keywords: collection/pharmacopée/République centrafricaine

Akendengué, B. 1992. Medicinal Plants Used by the Fang Traditional Healers in Equatorial Guinea. *Journal of Ethnopharmacology*. 37: 165-173.

Keywords: Equatorial Guinea/medicinal/medicinal plants

Abstract: This work is an ethnobotanical study of some medicinal plants used by the Fang traditional healers of two regions of Equatorial Guinea in Central Africa: Malabo and Bata. For each species listed, the

family, the botanical name, the voucher specimen number, the vernacular name, and the pharmacological and therapeutical properties are given.

Amadi, R.M. 1993. Harmony and Conflict between NTFP Use and Conservation in Korup National Park, In: Rural Development Forestry Network Paper. Hobley, M. and Shanks, E., eds. London: ODI. 15c: 21-28.

Keywords: conflict/conservation/national park/rural/rural development/website

Web/URL's: <http://www.oneworld.org/odi/fpeg/networkpapers15english.html>

Notes: This paper looks at NTFP issues around Korup National Park. The discussion includes the following sections: Importance of Non-Timber Forest Products, Harmony and Conflicts, What the Project is Doing, and What More Could Be Done in the Future. It can be downloaded in PDF format from the website indicated.

Ambrose-Oji, B. 1997. Forest Livelihoods: Implications for Biodiversity Conservation. Analysis of the MCP-GEF Socio-Economic Survey Data for the West Coast and Bomana Corridor Area. Limbe, Mount Cameroon Project. 123 p.

Keywords: Cameroon/conservation/household/Limbe/market/markets

Abstract: Excerpted from the Executive Summary: "The MCP-GEF Socio-Economic Surveys (SES) ran for one year, between July 1996 and July 1997, combining GEF survey objectives with objectives specific to the Mount Cameroon Project. The result was a survey of the MCP West Coast/Bomana corridor, an area of high social and biological diversity, which focused on the contribution forest products made to the livelihoods of communities within three CDC plantation camps; Scipio, Rechtsfluss, and Soden. The sale and trading of forest and farm bush products in five important markets namely; Scipio/Rechtsfluss, Soden, Idenau, Batoke, and Limbe, was also investigated.

"The questions the surveys were designed to answer were:

Are people using the forest as a significant part of their livelihood strategies?

Who or what are the characteristics of the people who are using the forest in this way?

Why are people using the forest in this way?

What are the most important products in terms of and including their contribution to household livelihood security?"

Notes: This report provides a thorough description of forest product use for the study area. The study methodology and recommendations sections are exemplary.

Ambrose-Oji, B. 1997. Valuing Forest Products from Mount Cameroon. Theme 4: Valuing Forest Resources for Conservation Purposes. Kent, England. Wye College, University of London.

Keywords: Cameroon/conservation/economic/forest management/household/market/valuation

Abstract: "In common with many other contemporary forest management conservation projects, the Mount Cameroon Project has multiple objectives. This paper introduces aspects of the project's socio-economic surveys that attempt to deal with some of the tension between economic techniques and practical forest management issues. The challenge for the socio-economic survey was to combine the project's identified information needs with a measure of forest value that not only reflected project objectives but could ultimately provide a useful valuation for field-level forest management decision making processes. Indirect valuation techniques were adopted to infer the wider values of forest land to national and local communities based on market, household, and user group surveys. The work is ongoing so this paper represents only preliminary data and ideas from the surveys. The detail and volume of data collected have the potential to make a significant difference to the way the project understands strategies of forest use by local communities and the way in which biological and socio-economic data and perspectives can be linked. Applying market values to forest land use and resource use can help to make forest management a less abstract concept to users and stakeholders. Finally, by illuminating exactly how, and which, users or stakeholders hold financial interests in the forest through market valuations, the Mount Cameron Project will be able to better advise on the implementation of appropriate participatory management systems."

Notes: This preliminary report includes an interesting section on lessons learned with respect to the study techniques.

Arnold, J.E.M. 1994. The Importance of Tree Products in Rural Income and Employment. Workshop on Non-Timber Tree Product Market Research. 1994 December 12-14. Annapolis, Maryland. Oxford, England: University of Oxford. 27 p.

Keywords: employment/household/income/market/policy/production/rural/participation

Abstract: "This paper focuses on activities that generate income and employment. Covered are a number of people involved, the role of tree products' income in rural households, differential participation and benefits among segments of the population, production characteristics and trends, and policy issues."

Notes: This paper is global in scope taking most of its examples from southern and eastern Africa and southeast Asia. It includes five pages of references.

Arnold, J.E.M. 1994. Nonfarm Employment in Small-Scale Forest-Based Enterprises: Policy and Environmental Issues. Working paper # 11. EPAT/MUCIA Research and Training. 49 p.

Keywords: employment/enterprises/policy/research

Arnold, J.E.M. and Townson, I.M. 1994. Sustainability of Economic Activities Based on Non-Timber Forest Products: Phase 1. Workshop on Non-Timber Tree Product Market Research. 1994 December 12-14. Annapolis, MD.

Keywords: sustainability/economic/market/research

Arnold, J.E.M.; Liedholm, C.; Mead, D.; and Townson, I. 1994. Structure and Growth of Small Enterprises in the Forest Sector in Southern and Eastern Africa. OFI Occasional Papers. 47: 34.

Keywords: growth/small enterprise/enterprises/website

Web/URL's: <http://www.plants.ox.ac.uk/ofi>

Notes: This paper can be purchased on the website.

Arnold, M. and Townson, I. 1998. Assessing the Potential of Forest Product Activities to Contribute to Rural Incomes in Africa, In: Natural Resource Perspectives. Farrington, J., ed. London: ODI. 37: 1-4.

Keywords: demand/household/income/market/policy/rural/urban/website
Web/URL's: <http://www.oneworld.org/odi/nrp/37.htm>

Abstract: "Large numbers of rural households in Africa continue to generate some of their income from forest product activities. Much of this involvement, however, is in labor-intensive low-return activities that help to provide the poor with an income safety net, but which declines once better alternatives become available. Expansion of forest product activities is likely to be concentrated on a limited number of products and services for which demand grows with rural and urban development. The paper reviews the implications of this dichotomy for support and resource management strategies.

"Policy Conclusions

Intervention strategies need to recognize the distinction between those who are engaged in forest product activities because they lack alternative means of sustenance and those who are responding to market opportunities.

"It may be more fruitful to help people engaged in activities with declining prospects to move into other more rewarding fields of endeavor, rather than seeking to raise their productivity in their current line of work.

"Support to sustainable types of activity should be geared to meet the different needs of those at different points in the enterprise development process (start-up, expansion from a small beginning, further upgrading, etc.).

"Management of resources should take account of the declining prospects for some of the presently more important products, the likely concentration of demand on a limited number of products of growing commercial value, and the need to often maintain forest resources for their 'buffer' role in times of hardship.

"Where reliance on forest products is likely to decline, care needs to be taken not to commit communities to institutional arrangements that they are unlikely to be able to sustain once forest products are less important in their livelihoods."

Notes: This paper can be read at the website indicated.

Assibey, E. 1990. Situation et Potentialités de la Faune Sauvage et Autres Produits Non-Ligneux dans les Forêts Tropicales Africaines. En: Position et Potentialités des Produits Autres que le Bois dans la Mise en Valeur Durable des Forêts Tropicales. Actes du Seminaire International. Japan. 11 p.

Assitou, N. 1994. Bilan National d'Utilization des Produits Forestiers Non-Ligneux: Congo. Draft Proceedings of a workshop on Extractivism and Potentialities of Multiple Use Forest Management Resources in Africa. 1994 May 8-13, Naro Moro, Kenya. 5 p.
Keywords: Congo/forest management

Association pour la Développement de l'Information Environnementale website. Hosted by Association pour la Développement de l'Information Environnementale: Libreville, Gabon.

Web/URL's: <http://www.adie-prgie.org/>

Contact/Web Master: adie@internetgabon.com

Keywords: Cameroun/Congo/Gabon/Guinée Equatoriale/RCA/RDC/République centrafricaine/entreprises/website

Abstract: From the Outils d'information page: "La Base de métadonnées est un outil qui permet de recenser et d'organiser d'une part les sources de données bibliographiques, statistiques, cartographiques ou photographiques existant sur l'Afrique Centrale, et d'autre part les informations de référence sur les institutions, projets et experts environnementaux intervenant dans la sous-région. Son intérêt est à la fois d'ordre technique et scientifique en assurant une plus grande visibilité des acquis, et d'ordre économique en évitant la duplication des efforts et des investissements. L'outil est en phase de développement et devra permettre de satisfaire les demandes d'information les plus fréquentes. Ces demandes concernent essentiellement: L'accès aux données à référence spatiales (cartes, images, modèles numériques ...); La disponibilité de publications environnementales; Les informations de base sur les projets environnementaux en cours, leurs objectifs, leurs publications, leurs financements; Les références d'organismes et bureaux d'étude intervenant dans les secteurs environnementaux en Afrique Centrale."

Notes: Association pour la Développement de l'Information Environnementale is a network of subregional agencies, public and private enterprises, and Non Governmental Organizations aiming to

“partager leurs connaissances en vue d’une gestion durable des écosystèmes forestiers du bassin du Congo.” Their website is under construction but promises to be useful to those involved with NTFP’s that want to build on existing information and avoid duplication of effort.

Ayensu, E. S. 1976. Alternatives for Biological Resources in Africa. *Journal of the Washington Academy of Sciences*. 66(4): 197-205.

Keywords: economic/food/medicinal/research/economic potential

Abstract: “This paper calls attention to the fact that most of the current basic food items featured in the diets of African homes were historically recent introductions to that continent. Attention is given to the need to develop the underexploited plants and animals that seem to have economic potential. The local sources of plant and animal proteins, including fish proteins, are discussed. Observations of the changing food habits of the African continent’s people are made. The need for substantial research on the continent’s biological resources is discussed.”

Notes: This paper provides an early scholarly overview of bioresources, including NTFP’s, in Africa.

Ayuk, A. 1997. Le Eru en Danger de Mort. *Earth Communicator*. 2: 1-4.

Keywords: eru

Ayuk, E.T.; Duguma, B.; Franzel, S.; Kengue, J.; Mollett, M.; Tiki-Manga, T.; and Zekeng, P. 1999. Uses, Management, and Economic Potential of *Dacryodes edulis* (Burseraceae) in the Humid Lowlands of Cameroon. *Economic Botany*. 53(3): 292-301.

Keywords: Cameroon/Cameroun/commerce/*Dacryodes edulis*/Dacryodes/Dacryodes edulis/economic/farm-level/fruits/Gabon/humid lowlands/improvement objectives/medicine/pharmacopée/production/propagation/trade/yield/economic potential/Nigeria

Abstract: ENGLISH: “*Dacryodes edulis* is one of the most preferred tree species by farmers in the humid lowlands of Cameroon. The fruit of the species figures prominently in cross-boundary trade between Cameroon, Nigeria, and Gabon. Although empirical data on the volume of trade of the fruit at this level exist, no data are available at the farm level. A field survey was undertaken to identify uses, management, and farmers’ improvement objectives and to quantify, at the farm-level, the

economic potential of the species. The results of the survey indicate that *D. edulis* is widely planted and found mainly in tree crop fields and in home gardens. The fruit is highly consumed and traded. The farm-level value of fruit production reaches US\$161 a year per grower or collector. The dead branches of the species are used as firewood and its bark is used as medicine. Desired improvement objectives include increased fruit size, good tasting fruit, high yield, and reduced time to bearing.”

FRENCH: *Dacryodes edulis* est l’une des espèces préférées par les paysans des basses terres humides du Cameroun. Les fruits font l’objet d’un commerce inter-frontalier entre le Cameroun, le Gabon et le Nigeria. Bien que les données sur ce commerce soient disponibles, il manque de données à l’échelle de l’exploitation paysanne. Une enquête a été menée pour identifier l’utilisation de produits de l’espèce, son mode de gestion et les caractéristiques que les paysans aimeraient voir améliorer. L’autre objectif de l’enquête consistait à quantifier, au niveau des paysans, le potentiel économique de l’espèce. Les résultats de l’enquête montrent que les plants issus de semis constituent le mode de propagation le plus utilisé pour la reproduction du *D. edulis* et que l’espèce se trouve principalement dans les cacaoyers, caféiers et jardins de case. Les fruits sont largement consommés et vendus. La valeur annuelle de la production de fruit atteint US\$161 par producteur ou collecteur. Les branches mortes sont utilisées comme bois de chauffe et l’écorce est utilisée en pharmacopée traditionnelle. Parmi les axes de recherche sur l’amélioration de l’espèce souhaités par les paysans on note l’augmentation de la taille du fruit, l’amélioration du goût, l’augmentation de la production annuelle et la réduction du temps à la fructification.

Ayuk, E.T.; Duguma, B.; Franzel, S.; Kengue, J.; Mollett, M.; Tiki-Manga, T.; and Zekeng, P. 1999. Uses, Management and Economic Potential of *Irvingia gabonensis* in the Humid Lowlands of Cameroon. *Forest Ecology and Management*. 113: 1-9.

Keywords: Cameroon/domestication/economic/economic potential/farm-level/fruits/humid lowlands/improvement objectives/international trade/*Irvingia*/*Irvingia gabonensis*/kernel/medicine/preparation/production/trade/yield

Abstract: “*Irvingia gabonensis* is one of the most preferred tree species by farmers in the humid lowlands of Cameroon. The kernel of the species figures prominently in international trade in West Africa. Although empirical data on the volume of international trade of the

kernel exist, no data are available at the farm-level. The species generally grows in the wild and very little effort has been made to domesticate it. As part of a prioritization exercise, a field survey was undertaken to quantify, at the farm-level, the economic importance of the species. Uses, management, and farmers' improvement objectives were also identified. The results of the survey indicate that *Irvingia gabonensis* is propagated rather by transplanting wildlings than by planting seedlings and is found mostly in tree crop fields (for example, cocoa and coffee). The kernel or seed is highly traded and is also transformed into a paste that is used in the preparation of sauces. *Irvingia* wood is used for timber, its dead branches for firewood, and the bark is used as medicine. The farm-level annual value of production for *Irvingia* averages US\$93.00–US\$15.00 from fruits and US\$78.00 from seeds—per grower/collector in some regions. Desired improvement objectives include increasing fruit size, improving the taste of fruit, increasing yield, reducing tree height, and time to bearing.”

Bailey, R.C.; Head, G.; Jenike, M.; Owen, B.; Rechtman, R.; and Zechenter, E. 1989. Hunting and Gathering in Tropical Rain Forest: Is It Possible? *American Anthropologist*. 91: 59-81.

Keywords: agriculture/gatherers/hunters/hunting/research/Malaysia

Abstract: “Hunters and gatherers living in tropical forests represent an important part of the total range of variation among contemporary hunting and gathering societies. Studies of tropical forest hunting and gathering peoples have contributed to our perceptions of the foraging way of life. Yet no peoples have ever been directly observed living independently of agriculture in tropical rain forests. This article tests the hypothesis that humans do not exist nor have ever existed independently of agriculture in tropical rain forest. We find no convincing ethnographic evidence and, with the possible exception of Malaysia, no archeological evidence for pure foragers in undisturbed tropical rain forests. Negative evidence cannot be conclusive, but it suggests that we need to carefully reexamine common assumptions concerning the recent history of tropical forest dwellers, the adaptability of preagricultural humans, the geographic and environmental range of hominids, and the form and consequences of selection pressures acting on humans in warm, humid environments. The overriding purpose of this article is to stimulate further ecological and archeological research in the neglected tropical forest areas of the world.”

Balick, M.J. and Mendelsohn, R. 1991. Assessing the Economic Value of Traditional Medicines from Tropical Rain Forests. *Conservation Biology*. 6(1): 128-130.

Keywords: economic/medicinal/medicine/present value/medicinal plants

Abstract: “The authors sampled medicinal plants in plots in Belize to determine their present economic value. Values ranged from over US\$70 to about US\$3,327 per hectare. These values combined with those of other sustainably exploited NTFP’s indicate that these forests need to be conserved and carefully managed.”

Notes: This article stimulated the NTFP sector. However, subsequent analyses have substantially refined the conclusions.

BDCP Publications website. Hosted by Bioresources Development and Conservation Program, Silver Spring, MD.

Web/URL’s: <http://www.bioresources.org>

Contact/Web Master: bdcp@bioresources.org

Keywords: botany/conservation/drug/medicine/pharmaceutical/policy/medicinal/research/production/monitoring/benefit sharing/pygeum/website

Abstract: Excerpted from the About Us page: “The BDCP was initiated in its entirety by indigenous staff. It is now essentially a cooperative of scientists, policymakers, industries, organizations and individuals from all walks of life who are interested in conservation and development of biological resources in the tropics with special reference to Africa.”

Notes: This website contains the BDCP newsletter with articles in HTML format, as well as a selection of BDCP books. Much of the material is focused on Central Africa.

Bedi. 1992. Possibilités de Commercialization des Produits de Cueillette et d’Articles d’Artisanat Utilitaire des Baka de l’Est Cameroun. Yaoundé, Bureau d’Etudes de Développement Intégré.

Keywords: artisanat/Cameroon/Cameroun/commercialization/Cueillette

Bee, O.J. 1990. The Tropical Rain Forest: Patterns of Exploitation and Trade. *Singapore Journal of Tropical Geography*. 2(2): 117-142.

Keywords: deforestation/exploitation/logging/trade

Abstract: Excerpted from the Introduction: “Except for the study on the export of tropical hardwoods in the 20th century by Laarman (1988),

and earlier accounts by Pringle (1976; 1979), the literature on tropical forests and deforestation has not focused on logging for timber in the tropics as a whole. The present study is an attempt to fill the gap. It expands on Laarman's work, and looks at the changing patterns of trade in forest products, from the so-called 'minor' forest products to the major forest product of the present day - timber. Logging for timber and the shifts in the timber trade patterns in each of the major tropical regions - Africa, America and Southeast Asia/Pacific—are examined in turn. Statistical data are derived mainly from the FAO Yearbooks of Forest Products, the latest available being the 1990 edition, which contains data for the year 1988. The article concludes with a brief discussion on some of the issues connected with unsustainable rates of logging the tropics."

Békalé, A.; Ngoghe, G.; and Nguéma, A. 1996. Les rotins au Gabon: une filière complète depuis les zones de production jusqu'aux produits finis des ateliers de Libreville. *Gabon information*. pp. 1-4.
Keywords: rotins/rotin/Gabon/filière/production

Bene, D. 1994. Etude de la Filière de Transformation du Rotin dans la Ville de Yaoundé. Memoire Final d'Etude, Université de Dschang. 117 p.
Keywords: Cameroun/rotin

Betti, J.L. 1998. Importance en Médecine Traditionnelle de *Combretum mucronatum* Shum dans la Région Forestière du Dja (Cameroon). Yaoundé, MINEF/ECOFAC. 25 p.
Keywords: Cameroon/*Combretum*/medicinal/parasites/traditional use
Web/URL's: ecofac@camnet.cm

Abstract: "Betti analyzed the data on the ethnobotany of *Combretum m.* around the Dja Reseve. These data show that *Combretum m.* is widely used by the local peoples to treat intestinal parasites. Preliminary studies indicate that *Combretum* is indeed active against many parasites. *Combretum* is still abundant in the zone despite the fact that traditional use typically results in the cutting of the entire plant."
Notes: This report provides substantial data on the use of *Combretum* around the Dja Reserve. Publication date is estimated.

Betti, J.L. and Nzooh Dongmo, Z.L. 1998. Les Produits Forestiers Non-Ligneux. *Canopée*. 12: 20-21; August.

Keywords: Cameroun/plantes médicinales/rotin/fruits/website

Web/URL's: http://www.ecofac.org/Canopee/N12/N1209_PdtForestiers/CamerounProduitsForestiers.htm

Notes: This short article has sections on “le rotin,” “les fruits,” and “les plantes médicinales” with a focus on the Dja Reserve. It is available in HTML format on the website indicated.

Bienvenu Welcome APFT website. Hosted by APFT, Brussels, Belgium.

Web/URL's: <http://lucy.ukc.ac.uk/Rainforest/page1g.html>

Contact/Web Master: apft@ulb.ac.be

Keywords: anthropology/conflict/conservation/ecology/economic/nutrition/sociology/website

Abstract: Excerpted from the About APFT/Program page: “Lack of concern for the human factor in tropical forest conservation and development schemes hamper their long term effectiveness. Ongoing projects, moreover, tend to be overly specialised and based on perceptions which are limited in both time and space. There is a growing awareness, however, that consideration of socio-cultural values is just as important to sustainable development as the type of environmental protection advanced thus far by natural scientists.

“Given the need to achieve a balance between natural and social science efforts in forest conservation, a consortium of five major European institutions has been constituted to examine in detail the interaction between human ecology and the environment. By adopting a holistic and interdisciplinary approach, the project hopes to contribute to the emergence of a nonreductionist understanding, upon which new forms of reflection and concrete actions can be based.

“Emphasis is on anthropological, ecological, economic, paleo-environmental, archaeological and demographic dimensions. The needs and knowledge of that increasing part of humanity which lays on the fringe of the global economy, problems of poverty, health and nutrition, urbanisation, migrations and inter-ethnic conflict will also be taken into account.”

Notes: This website provides access to numerous relevant APFT publications in HTML format. It has not been updated since 1996.

Bikié, H.; Ousseynou, N.; and Sunderlin, W.D. 1999. Crise Economique, Systèmes de Production, et Changement du Couvert Forestier dan la Zone Forestière Humide du Cameroun. CIFOR. 21 p.
Keywords: agricole/Cameroun/Commercialization/conservation/couvert forestier/crise/economique crise économique/déforestation nette/dévaluation/politiques macroéconomiques/production/système de production/rurale/economique/website
Web/URL's: http://www.cgiar.org/cifor/publications/publications_list.html

Abstract: Une étude basée sur un échantillon aléatoire de 648 ménages a été effectuée en 1998 dans 54 villages de la zone forestière humide du Cameroun. L'étude avait pour objectif majeur de mieux comprendre les effets de la crise économique, qui a commencé après 1985 et la dévaluation du Franc CFA survenue en Janvier 1994, sur les pratiques agricoles des petits paysans et les effets de ces pratiques sur les changements du couvert forestier. Quatre hypothèses ont été testées concernant: l'équilibre entre la production des cultures de rente et les cultures vivrières; le degré de commercialization de la production des cultures vivrières; la division sexuelle du travail et le degré de dépendance des populations rurales à l'égard des produits forestiers nonligneux.

Les résultats de l'étude ont montré que 1) les superficies allouées à la production du cacao ont stagné alors que les superficies allouées au café, au plantain et aux autres cultures vivrières ont augmenté; 2) les cultures vivrières sont beaucoup plus commercialisées par rapport au passé; 3) les hommes sont beaucoup plus impliqués dans la production des cultures vivrières comparé au passé; 4) un plus grand nombre de ménages collectent les produits forestiers nonligneux comparativement au passé; et 5) globalement, ces changements se sont probablement traduits par une augmentation de la déboisement nette.

L' étude conclut que la crise économique et les politiques macroéconomiques peuvent avoir des effets significatifs et inattendus sur l'utilisation des terres et des ressources de la forêt. Les politiques ayant pour objectifs la conservation et la gestion des forêts doivent tenir compte des effets de la crise économique et des politiques macroéconomiques.

Notes: The abstract was provided in advance of the completed paper. A February 2000 version in PDF format is available for downloading at the website indicated.

Bishop, J. T. 1999. The Economics of Non-Timber Forest Benefits: An Overview. London: IIED. 31 p.

Keywords: economic/research/conservation/policy/markets/market/dynamics/valuation

Web/URL's: <http://www.iied.org/bookshop/pubs/8102.html>

Abstract: "This paper, based on research carried out under the collaborative research programme Conservation, Management and Development of Forest Resources, provides an overview of the economics of nontimber forest products and services. It focuses on recent advances in the economic evaluation of forestry activities and, in particular, on how techniques for valuing nontimber forest benefits in monetary terms can assist the development of forest policy and management systems. It first considers the nonmarket nature of many nontimber forest benefits and the reasons why markets often fail to account for them. The paper then reviews the different techniques used to evaluate nonmarket benefits in monetary terms and explores the long-term dynamics of forest value. It concludes with a brief discussion of how the results of valuation studies can contribute to improved forest policy and management."

Blackmore, P. and Nkefor, J. 1998. The Transfer of the Eru (*Gnetum africanum*, *G. buchholzianum*) Domestication Model to Village-Based Farmers on and around Mount Cameroon. Limbe: Limbe Botanic Garden. 8 p.

Keywords: Cameroon/demand/domestication/eru/food/*Gnetum*/household/Limbe/market/production/proposal/rural/yield/propagation/farm-level

Abstract: "The nontimber forest product known as "eru" is an important vegetable crop consumed by people living throughout the forested regions of central Africa. Originally eaten as a forest food by the *Bayangi* people, infrastructure improvements and migration have resulted in a demand from other ethnic groups both from Central Africa and abroad. To satisfy local, national, and now international demand, the harvesting pressure on eru has increased dramatically and in some areas this has pushed the species into regional extinction.

"Eru consists of the leaves of two species from the family Gnetaeaceae: *Gnetum africanum* and *G. buchholzianum*. Both these species occur as vines climbing high into the forest canopy. The crop is destructively harvested by cutting and then pulling the vine from the forest canopy. It is then stripped of its leaves, which are baled for transport. This harvesting method almost always kills the plant.

“Currently, all the eru marketed is harvested directly from the wild with none produced on either plantations or at the village farm level. The combination of increased demand and the destructive harvesting methods used has resulted in increasing scarcity of the product, together with an increase in market price. This is relevant because for many poor rural people eru is the best source of protein available. Unfortunately, as the market prices increase, the people who need it the most are unable to buy the vegetable.

“Over the past four years, Limbe Botanic Garden has successfully developed methods for the propagation and domestication of both *Gnetum africanum* and *G. buchiwizanium*. Trial cultivation under different soil and light conditions, using a variety of genotypes, has resulted in very positive yields and acceptable taste, color, texture, and quality. A range of cultural techniques has been developed. These include intensive eru production nurseries and a semiwild technique.

“The next step is to take this domestication program into villages and farm/fallow systems. We have the encouraging results from the cultivation trials and have been approached by several individuals interested in producing eru from domesticated *Gnetum* spp. plants. With this in mind, we feel confident that our attempts will be successful.

“The work is best considered within the context of a larger time scale. The first part of the work has already taken place with the establishment of initial gene bank material and development of cultivation techniques for eru. The second part identifies people interested in adopting those cultivation techniques, trains them in workshop methods, and establishes field farm-based plantations. The third part will be to monitor the results of the workshop and subsequent farmer domestication activities, as well as how household consumption and sales of eru change with respect to wild harvesting.

“This essential work will hopefully result in the production of more affordable eru for the marketplace and home consumer, as well as reducing harvesting pressure on wild stocks in the long term. We are aware that this small trial will not solve all the problems and cannot immediately conserve the species. However, it will form a model for the future cultivation of the *Gnetum africanum* and *G. buchiwizanium*.”

Notes: This document is a US\$14,000 2-year proposal.

Bourobou-Bourobou H.P. 1990. La floraison et fructification de quelques essences forestières à fruits comestibles au Gabon.

Libreville: IRET/UNESCO. 47 p.

Keywords: Gabon/fruits

Bourobou-Bourobou H.-P. and Posso, P. 1995. Un aperçu sur l'importance des arbres fruitiers sauvages dans le Nord-Est du Gabon. *Nature et Faune/Wildlife and Nature*. 11(3): 42-48.

Keywords: Gabon

Brocklesby, M.A. and Ambrose-Oji, B. 1997. Neither the Forest nor the Farm Livelihoods in the Forest Zone-The Role of Shifting Agriculture on Mount Cameroon, In: Rural Development Forestry Network Paper. Brown D. and Schreckenber, K., eds. London: ODI. 21d: 1-20.

Keywords: agriculture/Cameroon/economic/rural/shifting cultivation/sustainable management/rural development

Web/URL's: <http://www.oneworld.org/odi/rdfr/ppbycountry.html#21d>

Abstract: Excerpted from the Introduction: "Work on identifying the relationships (social, economic and ecological) between forest, fallow, farm land and the social actors involved is ongoing. We stress the preliminary nature of our data analysis, but present here some of the key issues that have emerged during field work in two different project areas: three indigenous villages located on the upper slopes of Mount Cameroon between 650 m and 800 m - the Upper villages, and three plantation labor camps nestled amongst the lowland evergreen forest and oil palm plantations of the West Coast region of Mount Cameroon - the West Coast camps.

"In both cases shifting cultivation is showing itself to be a flexible and enduring strategy under changing and increasingly uncertain circumstances. We examine here: the different role of shifting agriculture in the livelihood systems in the Upper villages and the West Coast camps; possible reasons for the differences; and some implications for sustainable management of natural resources."

Notes: This report includes an interesting discussion on the NTFP-shifting cultivation dynamic.

Brown, M. 1999. Cameroon NTFP's: Selecting Species/Products for International Market Development: Proposed Next Steps for CARPE/IR1. Washington, DC: Innovative Resources Management. 5 p.

Keywords: aframomum/market/trade/Ghana/Cameroon/markets/international trade/demand/yield/production/website/food/growth/research/Gabon/collection/CAR/oil content/Certification/Central African Republic/Congo/traditional use/medicine/medicinal/medicinal plants/pharmaceutical/domestication/conservation/policy/forest management/marketing/impacts/pest/agriculture/processing/Uganda/sustainability/economic/profitability/slash and burn/income/tenure/pygeum/Prunus/Prunus africana/South Africa/sustainable management/ecology/community development/bibliography/Equatorial Guinea/regeneration/ethnobotany/preparation/rattan/Laccosperma/Laccosperma secundiflorum/robin/botany/hunting/insects/urban/gatherers/women/Malaysia/rural/Limbe/employment/drug/exploitation/Pausinystalia/Pausinystalia johimbe/overexploitation/logging/propagation/Vegetative Propagation/nutrition/commercialization/inventory/search/Cola/Garcinia/Ricinodendron

Web/URL's: Brown1irm@aol.com

Notes: This brief report describes the framework used to select target NTFP's for further development within the USAID CARPE project. There is a 29-page annex of Product Information Sheets. This Annex provides a recent overview of *Aframomum* spp., *Laccosperma secundiflorum*, *Pausinystalia johimbe*, *Physostigma venenosum*, *Prunus africana*, *Strophanthus gratus*, and sustainable cocoa. Included are summaries of traditional uses, commercial uses, sources, prices, market opportunities and constraints, and pharmacology. Also included are reference lists and product information website addresses.

Calvain, T. 1996. Essai d'Analyse de l'Exploitation des Produits Forestiers Non-Ligneux d'Origine Vegetale et de Leurs Usages dans la Zone Riveraine Sud de la Reserve Forestiere des Monts Rumpi. Diplôme d'Ingénieur Des Eaux, Forêts et Chasses, Département de Foresterie, Université de Dschang, Cameroon. 55 p.

Keywords: Cameroon/children/conservation/economic/medicine/production/women

Abstract: "The Rumpi Hills Forest Reserve is situated in the southwest province of Cameroon N'dian Division.

“The enclavement of the area and the lack of roads and health facilities oblige the local population to depend entirely on the forest for their daily needs.

“Our study placed emphasis on certain products that are important in the economy of the local people inhabiting the area (Rumpi Hills Forest Reserve). We studied their methods of production, usage, and conservation. We selected (in a systematic manner) 11 out of 20 estimated villages in the southern part of the Rumpi Hills Forest Reserve where we administered a questionnaire (Appendix II).

“In the course of this study, we found that the production of nontimber forest products (NTFP’s) of plant origin is mainly carried out by women and children. Nevertheless, due to economic hardship, men are getting involved in the production of these products. The production method of these NTFP’s is less developed. It is influenced by the lack of roads and the difficulties in preserving large quantities.

“The nutritional habit of the local population is based on NTFP’s, which are the principal source of vitamins and proteins. In most cases, NTFP’s serve as the main source of medicines and other remedies for the local people. In construction, NTFP’s constitute the skeleton make-up of houses and also an integral material for roofing.”

Notes: A French language document.

Cayuela Serrano, N. 1997. Etude de Terroir Coutumier du Village de Engombegombe, à la Réserve Forestière de Ndote. Rapport Intermédiaire. Bata, Projet CUREF. 56 p.

Keywords: conservation/Guinée Equatoriale/Equatorial Guinea

Abstract: Le présent étude se réalise à fin d’identifier la superficie du terroir villageois de Engombegombe, et les modalités d’exploitation du milieu, dans le cadre du projet CUREF dont l’objectif général est d’élaborer un plan national de classification des terres et d’utilisation rationnelle des ressources naturelles de Guinée Equatoriale.

Le village se situe dans la région Littorale, les populations concernées appartiennent aux ethnies Fang, Bapuku et Bisio, et présente comme spécificité le fait d’avoir une “*reserva de poblado*” et de se situer dans la concession qu’exploite la compagnie forestière (SOFOGE). L’analyse des résultats s’oriente dans l’intérêt du CUREF de l’association des

villages au plan d'aménagement forestier et la protection prévue d'une bande littorale pour la conservation.

Central Africa Regional Program for the Environment website.
Hosted by University of Virginia, Washington, DC.

Web/URL's: <http://carpe.gecp.virginia.edu/>

Contact/Web Master: mcrisologo@turbodog.gsfc.nasa.gov

Keywords: agriculture/bibliography/Cameroon/Cameroun/Congo/conservation/directory/Equatorial Guinea/écotourisme/Gabon/hunting/impacts/Limbe/logging/mapping/market/market survey/parks/remote sensing/research/tourism/website/Zaire/deforestation/exploitation/shifting cultivation/urban/forest cover/search

Abstract: Excerpted from the home page: "CARPE is a new initiative by USAID to address the issue of deforestation in the Congo Basin forest zone, in the middle of the African continent. One of the least developed regions of the world, the Congo Basin, holds massive expanses of closed canopy tropical forest, second only to the Amazon Basin in area.

"Much of this forest remains relatively intact, yet unsustainable timber exploitation, shifting cultivation, urban expansion, and other human themes are posing increasing threats to this globally-significant tropical forest resource. Loss of forest cover on this scale imposes serious risks of loss of biodiversity, and emission into the atmosphere of carbon dioxide previously locked-up in forest biomass."

Notes: This site has search capabilities that allow users to look within the site for a given term. It has a links page with an abundance of links to organizations, many of which have information on NTFP's. There is also a set of pages that include reports and publications generated through CARPE activities.

Many documents on this site are in PDF format. This site is updated as new documents are produced.

Central African Regional Programme for the Environment (CARPE). 1999. *Non-Wood News: An Information Bulletin on Non-Wood Forest Products*. 6: 3-6.

Notes: This is an excerpt from the proceedings of the International Expert Workshop on nonwood forest products in Central Africa. The article summarizes the ecological, socio-political, and market-economic lessons and priority actions as discussed by experts.

Cesaro, L., M. Linddal, and Pettenella, D. 1995. The Economic Role of Non-Wood Forest Products and Services in Rural Development. *Medit.* 95(2): 28-34.

Keywords: economic/policy/production/rural/rural development/valorization

Abstract: “The major aim of this work is to identify the principal regional differences in nonwood forest products and services in European countries. Analysis will be made of the available data regarding the production of nonwood products and services with respect to the different countries in the European community as well as a number of non-European Union countries (Scandinavia and countries in transition).

“A classification of nonwood products and services will be made in the introduction, emphasizing the major problems arising from analysis of nonwood products and services. The first part of the paper takes account of nonwood products in different European countries. The attempt is first and foremost, to provide an outline of the major differences among the individual countries, in particular between the Mediterranean area and northern European countries. In the second part of the paper, attention will be placed on the issue of quantification of services provided by European forests, underlining the problem of the lack of information and the difficulty of putting a monetary value on many of the nonmaterial benefits from woodland. Finally, some suggestions are put forward for a policy of valorization of non-wood forest products and services in the European Union.”

Notes: This paper focuses exclusively on Europe. However, it looks across countries, as is the case in Central Africa where cross-border approaches are often considered essential.

Chabot, I. 1997. Etude de la Filière des Produits Forestières Non Ligneux au Gabon. DESS, Faculté de Sciences et Technologies, Université Paris XII Val de Marne, Paris. 52 p.

Keywords: chasse/commerce/filière/Gabon/rotin/chasseur

Abstract: Cette étude sur la filière des produits forestiers non ligneux au Gabon a été réalisée pour le PAFT-Gabon, par Isabelle CHABOT, dans le cadre d'un stage de 6 mois pour l'obtention du DESS Gestion des systèmes agro-sylvo-pastoraux en zones tropicales de l'Université Paris XII Val de Marne.

Les gouvernements de nombreux pays ont pris conscience de l'importance des PFNL dans l'économie de leurs pays, pour les emplois

et les revenus qu'ils génèrent. Cependant il fait que ce commerce informel continue à exister sans pour autant mettre en danger des espèces végétales et animales.

Les trois filières principales ont été étudiées: les PFNL d'origines végétale, la viande de brousse et le rotin. Les résultats ont montré qu'au Gabon une importante quantité de PFNL sont acheminés vers Libreville pour alimenter la population urbaine et il s'avère que les cueilleurs et les chasseurs vont de plus en plus loin pour se ravitailler. Il est donc nécessaire de connaître quelles sont les espèces. De plus, il est important de faire la différence entre une utilisation des PFNL par les populations pour leur subsistance et une utilisation commerciale (c'est surtout le cas de la chasse et du rotin).

Ce rapport d'aide permettra au PAFT de prendre en compte dans la révision de la loi forestière les PFNL pour une gestion durable des forêts.

Clark, L.; Tchamou, N.; and Merriam, R. 1997. La Recherche sur les Produits Forestiers Non-ligneux en Afrique Centrale: La Situation du Secteur. Compte Rendu Préparé pour: Le Programme Régional de 'Afrique Centrale pour l'Environnement (CARPE). Washington, DC: USAID. 36 p.

Keywords: agriculture/Cameroon/Cameroun/Congo/Gabon/République centrafricaine

Abstract: Excerpted from the Introduction: "Une équipe sous l'égide du CARPE a effectué une enquête régionale portant sur les institutions, des parties concernées, des chercheurs et les projets qui s'intéressent au secteur des PFNL pour faire le point de la situation et pour formuler des recommandations en vue d'un atelier régional. Ce rapport reflète les résultats de cette enquête. Celle-ci a été menée à bien pour le Cameroun et le Gabon. Dans la mesure où les conditions politiques et sécuritaires le permettront, elle pourra être étendue aux autres pays du bassin du fleuve Congo (République Centrafricaine, Guinée Equatoriale et République Démocratique du Congo).

"Une première étape du déroulement de l'enquête a été la prise de contacts initiaux avec les intervenants connus dans la région (au fur et à mesure de la progression de l'enquête, un contact conduirait à un autre, et ainsi de suite). Un déplacement était prévu dans la région avec des séjours de dix jours environ dans chaque des trois pays suivants:

Cameroun, République du Congo et Gabon. A quelques jours du début de l'enquête, des troubles politiques en République Démocratique du Congo ont fait qu'il a fallu renoncer à ce pays.

“Après l'arrivée au Cameroun de Laurie Clark, consultante au USDA Forest Service, elle et Nicodème Tchamou, de l'Institut International d'Agriculture Tropicale (IITA) ont finalisé le questionnaire qui serait ensuite utilisé pour des entretiens semi-structurés de 45 minutes environ. Des rendez-vous ont été pris, il y a eu un essai pour l'entretien, et le processus a débuté. Dix-sept entretiens ont eu lieu à Yaoundé, Kribi et à Limbé.

“Au Gabon, l'équipe d'évaluation a travaillé en étroite collaboration avec le bureau régional du CARPE à Libreville. Avant l'arrivée de l'équipe, le responsable du program, M. Clair Mbourou, a identifié divers intervenants clés et pris des rendez-vous avec eux. Tous ces entretiens, avec quatorze personnes, ont eu lieu à Libreville.

3. Conclusions

“Des tentatives antérieures pour procéder à un examen de la documentation existante et pour se faire une idée des activités actuelles dans la région n'avaient pas permis d'illustrer suffisamment le niveau d'activité du secteur des PFNL, tout au moins au Cameroun et au Gabon.

“L'enquête sous-régionale, présentée en détail dans le présent rapport, montre que le secteur des PFNL reste largement informel, avec quelques espèces économiquement importantes qui sont déjà exploitées. Des recherches sociologiques et anthropologiques effectuées dans la région ont identifié certaines espèces et leur utilisation mais elles n'ont pas, de manière générale, fourni une analyse approfondie.”

Notes: Appendices include results of the survey from Cameroon and Gabon as well as a list of contacts and publications. This report is also available in English.

Clay, J. 1992. Some General Principles and Strategies for Developing Markets in North America and Europe for Non-Timber Forest Products: Lessons from Cultural Survival Enterprises, 1989-1990. *Advances in Economic Botany*. 9: 101-106.

Keywords: certification/conservation/deforestation/enterprises/market/markets/processing/production/profit/sustainability

Abstract: “Tropical forests cannot be cut down until the people who

live in them are driven out. To prevent this from happening, forest residents must become organized to defend themselves and to enter the market economy on their own terms. Cultural Survival Enterprises (CSE) was founded to expand and develop markets for nontimber forest products (NTFP's) from organizations of forest residents. Here, we present the lessons that emerged from CSE's first year of operation. They include (1) start with NTFP's that are already on the market, (2) diversify production and reduce dependence on just a few products, (3) diversify the markets for raw and processed forest products, (4) add value to the product locally (through processing), (5) capture product value that is added further from the source, (6) proposed solutions to deforestation and displacement of forest peoples must equal the scope of the problem, (7) no forest group can provide enough commodities for even a small company in North America or Europe, (8) controlling a large market share of a commodity allows considerable influence over the entire market, (9) make a decent profit in the marketplace, not a killing, (10) the markets in North America and Europe are for saving the rain forests and for conservation rather than for forest peoples, and (11) certification of environmental sustainability is key."

Cogels, S. 1997. *Etude du Terroir Coutumier du Village d'Ayamiken (Reserve Forestière Rio Ntem/Rio Campo)*. Bata, Project CUREF. 28 p.

Keywords: agricole/agriculture/chasse/Guinée Equatoriale/hunting/traditional use

Notes: This paper describes the human context and land use within the traditional use area as defined by the most far-reaching use, hunting, for a *Fang* village of about 240 people. Included are maps that show the village layout, layout by "lignage," agricultural lands, forest land, agricultural lands in 1949 and 1992, and a number of maps that show how land is allocated for given families.

Cunningham, A. B. 1995. *African Medicinal Plants: Setting Priorities at the Interface Between Conservation and Primary Healthcare*. In: *People and Plants Working Paper*. WWF/Project 3331.

Keywords: sustainable management/medicinal/drug/medicinal plants/demand/medicine/agriculture/conservation/logging/pharmaceutical/growth/*Garcinia*/production/Côte d'Ivoire/Ghana/South Africa/dynamics/trade/international trade/sustainability/policy/buffer zone/research/monitoring/Nigeria

Web/URL's: <http://www.rbgekew.org.uk/peopleplants/wp/wp1/index.html>

Abstract: “Sustainable management of traditional medicinal plant resources is important not only because of their value as a potential source of new drugs, but because of a reliance on traditional medicinal plants for health. The vast majority (70–80%) of people in Africa consults traditional medical practitioners (TMP’s) for healthcare. With few exceptions, traditional medicinal plants are gathered from the wild.

“Although reliance on TMP’s may decline in the long term as alternative healthcare facilities become available, increasing demand for popular herbal medicines is expected in the foreseeable future. Over the same period, certain vegetation types that were sources of supply of traditional medicines will drastically decline due to forest clearance for agriculture, forestation of montane grasslands, uncontrolled burning, and livestock grazing. Exclusion from core conservation areas adversely affects TMP’s who previously gathered medicinal plants in those sites. In addition, supplies of herbal medicines to TMP’s are affected by competing resource uses such as timber logging, commercial harvesting for export and extraction of pharmaceuticals, and use for building materials and fuel. This creates a growing demand for fewer resources, in some cases resulting in local disappearance of favored and effective sources of traditional medicine and reduced species diversity.

“The most vulnerable species are popular, slow growing or slow to reproduce, or species with specific habitat requirements and a limited distribution. Although in theory, sustainable use of bark, roots or whole plants used as herbal medicines is possible, the high levels of money and manpower required for intensive management of slow growing species in multiple-species systems are unlikely to be found in most African countries. The cultivation of alternative sources of supply of popular, high conservation priority species outside of core conservation areas is, therefore, essential. However, commercial cultivation of such species is not a simple solution and at present is unlikely to be profitable due to the slow growth rates for most tree species and low prices paid for traditional medicines. These slow growing species are a priority for ex situ conservation and strict protection in core conservation areas. By contrast, the high price paid for some species does make them potential new crop plants for agroforestry systems (for example, *Warburgia salutaris*, *Garcinia kola*, *G. afzelii*, *G. epunctata*) or agricultural production (for example, *Siphonochilus aethiopicus*). Pilot studies on these species are needed.

“Priority areas for cooperative action between healthcare professionals and conservationists are rapidly urbanizing regions with a high level of endemic taxa, particularly West Africa (Guinea-Congolian region), specifically Côte d’Ivoire, Ghana, and Nigeria; East Africa (Ethiopia, Kenya, Tanzania); southeastern Africa (South Africa, Swaziland). The most threatened vegetation types are Afromontane forest and coastal forests of the Zanzibar-Inhambane regional mosaic.”

Cunningham, A.B. People, Park and Plant Use: Recommendations for Multiple-use Zones and Development Alternative Around Bwindi Impenetrable National Park, Uganda, In: People and Plants Working Paper. Semple, A. and Höft, R., eds. Paris: UNESCO.

Keywords: Afromomum/agriculture/basketry/beekeeping/Bwindi/Cameroon/carving/collection/conservation/ecology/food/forest management/fruits/Fuelwood/growth/honey/household/impacts/income/market/marketing/markets/medicinal/medicinal plants/national park/production/regeneration/Uganda/website

Web/URL's: <http://www.rbgekew.org.uk/peopleplants/wp/wp4/index.html>

Abstract: “This report focuses on resource use and management issues relating to wild plants and multiple-use zoning in Bwindi Impenetrable National Park. Foresters usually group products into two categories for forest management purposes: major forest products (such as timber, fuelwood, or other wooden products) and minor forest products (all nonwooden products).

“The results and recommendations of this report are presented first for the latter category, involving mainly specialist users of nonwood products, including wild plant resources, honey, basketry, and bamboo use. The various uses of wood, the major forest products, (for example, blacksmiths, carved wooden handicrafts, beer boats, building poles, and bean stakes) are then considered.”

Notes: Can be downloaded in HTML format at the website indicated. It is also available in French.

Cunningham, A.B. 1993. Ethics, Biodiversity, and New Natural Products Development. Guidelines for the Equitable Use and Development of Indigenous Knowledge and Biological Resources. Gland, Switzerland: World Wide Fund for Nature.

Keywords: conservation/research/rattan/collection/pharmaceutical/

economic/income/drug/South Africa/policy/search/parasites/medicinal/
medicinal plants/preservation/preparation/traditional use/Garcinia/
sustainability /overexploitation/regeneration/fruits/Malaysia/medicine/
Cameroon/website/indigenous knowledge/training

Web/URL's: <http://www.rbgekew.org.uk/peopleplants/dp/dp2/index.htm>

Abstract: “In an ideal world, biological diversity would be protected for ethical, aesthetic, or spiritual reasons. Forests, coral reefs, or wetlands, for example, would be conserved out of respect for other forms of life, for their natural beauty, or for the spiritual link provided between the human species and the natural world. Unfortunately, this is not the case. Forests, coral reefs, and wetlands are not being adequately conserved. They are being replaced at an alarming rate by monocultures of crops, pasture, algae, or by construction projects.

“Fortunately, utilitarian values (monetary and nonmonetary) are playing an important role in justifying the conservation of biodiversity as a form of land use. Chemical prospecting is a useful argument in favor of conservation.

“In an ideal academic world, there would be a free flow of knowledge for the good of all. But once again, this is not the case. In the development of natural products and in chemical prospecting, research knowledge is often patented before it is made public ensuring a flow of benefits only to the patenting country or company.

“Biodiversity will only be relevant to national governments or local people if a fair share of benefits from new natural products is returned to the region of origin. Until recently, however, chemical resources—whether derived from plants, corals or microorganisms—were considered global common property. The fact is that biodiversity is being destroyed because it is undervalued, and chemical compounds that are the precursors of new natural products are no exception. To consider chemical compounds of the wild habitat as a global commons, freely available to all, reduces their value to national governments and to local people who are best placed to conserve them. For this reason, clear guidelines are required for the development of new natural products.

“National sovereignty is recognized wherever oil, minerals, timber, rattan, and several other resources are found. Why should it not also apply to the chemical compounds that come from species with limited distribution? They are the starting points for the development of new natural products.

“And what about the indigenous knowledge that provides a key to the active ingredients in plants or fungi? Why shouldn’t this be recognized as the valuable product of an intellectual and experimental process? Why shouldn’t local rights be attached to this knowledge as well as the natural compounds from biodiversity, before they are made public?”

“These questions cannot be resolved by ethnobiologists alone, but only through a wider awareness of the issues and actions required by governments, chemists, industrial companies, and the indigenous peoples involved. For this reason, these guidelines have been developed. They:

- outline the ethical and conservation issues that require the creation of equitable partnerships in the development of new natural products; partnerships that recognize and compensate for the use of indigenous knowledge and natural resources;
- facilitate international cooperation in the collection, conservation, use, and development of new natural products;
- ensure that any collecting for export and use outside a country has the full approval of the competent authorities, and is carried out with the cooperation of the host country and representatives of the local communities involved. They also ensure that these collections comply with conservation and quarantine regulations in the countries of origin and destination;
- outline the general principles that will facilitate the development of national regulations by governments or agreements between organizations.

“This is not a futuristic issue. In 1991, the American National Cancer Institute (NCI) awarded three 5-year collecting contracts worth \$3.8 million to two U.S. botanical gardens and the University of Illinois. A similar 5-year contract worth \$2.9 million was awarded to the Coral Reef Foundation for collecting marine organisms for screening. Kew Gardens has a contract from Glaxo to screen its living plant collection for active ingredients. In this way, scientific activities are directly linked to commercial interests. Understandably, national governments in the tropical countries concerned are asking, “What right do these organizations have to ‘privatize’ our resources?”

“A code of practice is suggested (see Appendix) that requires:

- Legislation to be enacted at a regional or national level to control the collection and export of biological material, with advice from appropriate professional organizations.

- strict code of professional ethics to ensure that:
 - research participants (for example, traditional specialists) and members of relevant local organizations (for example, herbaria) are fully informed of the objectives, commercial aspects, and possible results of research;
 - confidential information and research participants' requests for anonymity are respected;
 - equitable compensation is made for assistance by individuals;
 - the relevant national or regional organization receives fair royalty payments;
 - national requirements for plant collecting, including collection with local counterparts, are observed.
- Maximum use of local expertise within developing countries, or at regional levels, to undertake extraction and screening of important compounds. This should apply equally to compounds of regional significance (for example, anti-fungus or anti-parasite) and global significance (for example, anti-inflammation, anti-virus, anti-cancer). This will involve a commitment to training, technology transfer, and the development of practical, initial screening techniques. It will also require government support for local scientists and research organizations.
- Supply agreements should only be made with reputable organizations, not with individuals whose primary interest may be personal gain."

Notes: This report is available on the website indicated in HTML format.

Cunningham, A.B. 1997. An Africa-wide Overview of Medicinal Plant Harvesting, Conservation and Health Care. In *Medicinal Plants for Forest Conservation and Health Care* Bodeker, G. and Vantomme, P., eds. Rome: FAO. 14 p.

Keywords: conservation/Garcinia/Ghana/medicinal/medicine/production/SouthAfrica/trade/growth/medicinal plants/Nigeria

Web/URL's: *publications-sales@fao.org*

Abstract: "This paper gives an overview of medicinal plant harvesting for the commercial trade in traditional medicines, and its relevance to medicinal plant conservation and the self-sufficiency of traditional medical practitioners. The most vulnerable species are popular, slow reproducing species with specific habitat requirements and a limited distribution. Although in theory sustainable use of bark, roots, or whole

plants used as herbal medicines is possible, the high level of input of resources in terms of money and manpower required for intensive management of slow-growing species in multiple-species systems is unlikely to be found in most African countries. Cultivation of alternative supply sources of popular, high conservation priority species outside of core conservation areas is, therefore, essential. Commercial cultivation of high conservation priority species is not a simple solution and at present, unlikely to be a profitable exercise for most species due to slow growth rates and low prices paid for traditional medicines. These slow-growing species are a priority for ex-situ conservation and strict protection in core conservation areas. The high price paid for some species, however, makes them potential new crop plants for agroforestry systems (e.g., *Warburgia salutaris*, *Garcinia kola*, *G. afieliji*, *G. epunctata* or agricultural production (e.g., *Siphonochilus aethiopicus*) and pilot study commercial production is warranted. The following regions are considered to be priority areas for co-operative action between health care professionals, farmers, horticulturists, and conservation biologists: West Africa (Guinea-Congolese region), specifically Ghana, Nigeria and Côte d'Ivoire; East Africa (Kenya, Tanzania, Ethiopia), and southeastern Africa (Swaziland, South Africa). These are all rapidly urbanizing regions with a high level of endemic plant taxa. The most threatened vegetation types are Afromontane forests, coastal forests of the Zanzibar-Inhambane regional mosaic, and those in the Guinea-Congolese region."

Cunningham, A.B. and Davis, G.W. 1995. Chapter 20: Human Use of Plants. In: *Vegetation of Southern Africa*. Cowling, R.M.; Richardson, D.M.; and Pierce, S.M., eds. Cambridge University Press. 32 p.

Keywords: exploitation/historical/impacts/South Africa

Web/URL's: peopleplants@bigpond.com

Notes: A reference-type document that provides a comprehensive overview of how people have used and effected plants in southern Africa. There are many tables, illustrations, and examples of people-plant interactions. Includes an extensive reference list. Publication date is estimated.

Cunningham, A.B. and Mbenkum, F.T. 1993. Sustainability of Harvesting *Prunus africana* Bark in Cameroon: a Medicinal Plant in International Trade, In: People and Plants Working Paper. Semple, A. and Höft, R., eds. Paris: UNESCO.

Keywords: sustainability/*Prunus*/*Prunus africana*/Cameroon/medicinal/international trade/trade/website

Web/URL's: <http://www.rbgekew.org.uk/peopleplants/wp/>

Notes: This paper can be ordered from the website indicated.

David, O.L.; Fondoun, I.M.; and Ganga, N. 1996. Domestication of the Bush Mango (*Irvingia* spp.): Some Exploitable Intraspecific Variations in West and Central Africa. In: *Domestication and commercialization of non-timber forest products in agroforestry systems*. Leakey, R.R.B.; Temu, A.B.; Melnyk, M.; and Vantomme, P., eds. Rome: FAO. 12 p.

Keywords: agriculture/collection/commercialization/conservation/domestication/income/*Irvingia*/research/Vegetative Propagation/wild fruit/slash and burn/bush mango/propagation/*Irvingia gabonensis*

Web/URL's: publications-sales@fao.org

Abstract: "*Irvingia gabonensis* and *Irvingia wombolu*, the eating and the cooking types, respectively, of bush mango, have been identified by the International Centre for Research in Agroforestry as priority wild fruit tree species for domestication. With information on farmer trait preference, and in collaboration with national agricultural research systems, rangewide germplasm collections have been made. Germplasm banks have been established for genetic conservation and for early assessments of progeny variation. These trials, together with observations on mature field-grown trees, are revealing substantial intraspecific phenotypic differences.

"Morphological variations in vegetative and reproductive characteristics, including fruit quality attributes, have been found. Much of this intraspecific variation in the *Irvingia* species of west and central Africa provides opportunities for genetic improvement by genotypic selection and vegetative propagation. This could promote the domestication process of this important wild tree as a crop for agroforestry. This genetic improvement needs to go hand in hand with the commercialization of the bush mango's products to provide means for farmers to supplement their other forms of income and to help develop permanent land-use options, based on improved materials, as an alternative to slash-and-burn agriculture."

de Castro, A. 1993. Extractive Exploitation of the Açai (*Euterpe precatoria*) near Manaus, Amazonia. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; and Hadley, M., eds., *Man and the Biosphere Series*. Paris: UNESCO. 13:4.

Keywords: agriculture/demand/economic/exploitation/food/income/market/markets/preparation/production/search

Abstract: Excerpted from the Discussion section: "*E. precatoria* is one of many plants extracted from the Brazilian Amazon. It grows in low-lying land which is usually flooded and unsuitable for agriculture (Kahn, 1993, this volume). The exploitation of the fruit has many attractive characteristics. It is a nondestructive use of the forest which does not jeopardize *E. precatoria* populations. It is socio-economically important as it assures an income to the fruit collector; by contrast with many products of Amazonian extractivism, the *acai* is commercialized according to a monetarized system which responds to the law of supply and demand. The fruit is a perishable product which cannot be stored by the traders in the commercial network. Moreover, since consumption is strictly regional, the consumer market creates the demand and controls the production. A case study underway in Manauquiri should give a better picture of the importance of this product in the local economy. The consumer market is not saturated. *Açai* "wine" is a product with novel organoleptic qualities which could find an opening on the wider national, or even international market (search for new flavours) if preparation could be rationalized to offer a product of constant quality at a cost compatible with the characteristics of the market. All these different aspects underline *E. precatoria*'s economic importance. Conquering new markets will involve increasing and improving production, which could be ensured by introducing *E. precatoria* into agroforestry systems."

Defo, L. 1999. Des Lianes très Sollicitée: Les Rotangs dans la proche Campagne de Yaoundé. *APFT - News*. 6(3):9-12.

Keywords: economic/*Eremospatha macrocarpe*/exploitation/*Laccosperma secundiflorum*

Notes: This article argues that "rotangs" are being unsustainably harvested because of urbanization, the population explosion, technological changes, economic recession, and poverty. The author follows with a brief description of alternatives to consider for more sustainable future exploitation.

Defo, L. and Sunderland, T. 1999. Technical Note No. 4: L'Artisanat de Rotin en Milieu Urbain au Cameroun. rapport préliminaire. RBG, Kew, Richmond, Surrey, UK, African Rattan Research Programme. 40 p.

Keywords: rotin/Cameroun/marché/commercialization/conservation/valorisation/urban/Cameroun

Web/URL's: *afirrattan@aol.com*

Abstract: Excerpted from the Introduction: "1.3.1. Objectifs
Ce travail a les objectifs suivants

- i- Identifier les principales composantes, et les déterminants de l'artisanat de rotin dans les villes ainsi que ses caractéristiques essentielles.
- ii- Localiser les sites de cueillette et évaluer les quantités de rotin utilisées dans les villes.
- iii- Mesurer l'ampleur des activités urbaines de transformation du rotin dans les différents contextes physiques humains et économiques du Cameroun méridional
- iv- Relever les types, les qualités et les prix des articles offerts dans le Sud-Cameroun dans l'optique d'une éventuelle intervention au niveau commercial
- v- Identifier les marchés porteurs et les débouchés potentiels des articles concernés
- vi- Relever les principales difficultés liées à l'approvisionnement des villes en rotin, à l'artisanat de ce PFNL et à la commercialization de ses produits finis
- vii- Formuler des recommandations pour un meilleur développement de l'artisanat de rotin

1.3.2. Intérêts

Cette étude a un intérêt scientifique et pratique certain dans la mesure où elle peut:

- i- Permettre de cerner les différents aspects de l'artisanat de rotin dans les villes du Cameroun méridional
- ii- Apporter une petite contribution à la connaissance de l'artisanat et du secteur informel ainsi qu'à l'analyse de l'interface ville-forêt
- iii- Contribuer à l'orientation des recherches biologiques, écologiques et botaniques sur les rotangs à travers le sud Cameroun
- iv- Fournir des données importantes au niveau des actions éventuelles dans le domaine de la conservation, de la transformation rationnelle et de la valorisation accrue de ce PFNL

- v- Contribuer à l'oeuvre de dissipation du manque d'intérêt ou du mépris qui a longtemps frappé et frappe encore malheureusement les PFNL"

Defo, L. and Sunderland, T. 1999. Technical Note No. 4: L'Artisanat de Rotin en Milieu Urbain au Cameroun, Rapport Préliminaire. Interim Progress Report for the Central African Regional Programme for the Environment (CARPE) and the United States Forest Service Office for International Programs. London: African Rattan Research Programme, Kew. 40 p.

Keywords: artisanat/Cameroun/rotin/urbain

Abstract: Excerpted from the Introduction "Dans cet optique, et par rapport au rotin qui est l'un des PFNL le plus important au Sud-Cameroun (Debroux, 3, et Dethier, M. 1993 ; Béné, D. 1994 ; Ndoye, O. 1994, Defo, L. 1997, 1998) Nous nous sommes posés les questions suivantes:

- i. Quels sont les sites de cueillette de rotin transformé dans les villes du Sud-Cameroun? Quelles sont les quantités concernés?
- ii. Comment sont ravitaillées les unités de transformation du rotin en milieu urbain?
- iii. Quels sont les principales composantes, les déterminants, les caractéristiques et les problèmes essentiels de l'artisanat de rotin dans les villes du Cameroun?
- iv. Comment peut-on créer les conditions d'une utilisation rationnelle et plus profitable de la ressource cueillie?"

Dewees, P. and Scherr, S.J. 1994. Public Policy and NTTP Market Research: Issues and Approaches. Paper Presented at the IFPRI/CIFOR/ICRAF/NRI Workshop on NTTP Market Research. Annapolis, Maryland. Washington, DC: The World Bank and IFPRI. 47 p.

Keywords: conservation/historical/market/markets/policy/research/rural/urban

Abstract: Excerpted from the Introduction "The purpose of this paper is to clarify some of these linkages between NTTP markets and policies, and identify some priority needs for policy-oriented market research. The next section will outline the uses of market research in policy analysis and explain the limited historical role of market research for NTTPs. The third, fourth, and fifth sections will, respectively, examine the role of NTTP markets in the conservation of forests and woodlands,

in enhancing rural welfare, and in supplying urban and industrial markets. The paper concludes with a section describing the policy challenges in an era of massive transitions in the structure of NTTP markets.”

Notes: This document is marked “Draft — For Comment Only.”

Deweese, P. and Scherr, S.J. 1996. Policies and Markets for Non-timber Tree Products. EPTD Discussion Paper No. 16. Washington, DC: Environment and Production Technology Division, IFPRI. 76 p.

Keywords: conservation/economic/household/market/markets/policy/production/research/growth

Abstract: “Markets for nontimber tree products (NTTP’s) are widely viewed with great promise because of their potential for achieving a range of development objectives. Markets can, of course, be influenced by policy; but in order to do so, market information is needed to better inform the policy process. There has been increasing concern that few market studies have been adequate in doing so. There has been ambivalence at the policy level because these markets are highly diverse and difficult to characterize, and because governments tend to view NTTP markets as a threat to the conservation and management of forests and woodlands. Perhaps most importantly, however, there has been a failure to link the design of market studies with the potential for policy change. We argue in this paper that policies *per se* can be used to influence the operation of these markets, and that good market research should be more carefully designed to reflect explicit policy objectives.

“Policies toward the operation of NTTP markets have generally been designed to meet one or more of three objectives: to bring about the conservation of tropical forests and woodlands, to improve household welfare, or to support economic growth and development at the regional and national levels. These objectives are not necessarily compatible with each other. The link between market information and the development of policies toward the operation of NTTP markets poses considerable challenges for market research. Increasingly, market researchers must be brought into the policymaking process. In particular, market analysts must be encouraged to continually stretch their conceptual framework; to expand the ways of collecting relevant data; to broaden their use of analytical methods; and to consider more carefully the links between markets, the environment, household production, and household welfare.”

Notes: This paper is global in scope.

Directory of Information Resources for Non-Timber Forest Products. Russo, D., ed. 1998. Washington, DC: Conservation International. 40 p.

Keywords: data base/directory/website

Abstract: Excerpted from the Introduction: "The purpose of this directory is two-fold. First, it serves as a starting point for finding information about nontimber forest products (NTFP's), also known as nonwood products. Included are many kinds of resources, such as book titles, magazines, publishers and mailing lists. Names, addresses and telephone numbers are provided for all organizations. Many other listings include World Wide Web (Web) and e-mail addresses. Second, and especially useful, this directory also serves as a "how-to" manual for finding more NTFP resources using the Internet, the global network of computers that is revolutionizing communication. Since not everyone knows what Websites are and how e-mail works, this directory includes a basic introduction to the Internet and its tools."

Notes: While global in scope, this is an excellent document. Included is over 20 pages of organizations. Reports is a section devoted to NTFP publications, organizations, and databases. There is also a very good discussion of how to use the Internet to find information and a glossary of Internet terms.

Domestication and Commercialization of Non-Timber Forest Products in Agroforestry Systems. Leakey, R. R. B.; Temu, A. B.; Melnyk, M.; and Vantomme, P., eds. 1996. Rome: FAO. 297 p.

Keywords: commercialization/domestication/ethnobotany/*Irvingia*/marketing/policy/bush mango/bibliography/indigenous knowledge
Web/URL's: *publications-sales@fao.org*

Notes: This proceedings is global in scope. Many of the topics, however, may be of interest to those working in Central Africa. There are sections on NTFP domestication and commercialization, policy and institutional aspects, indigenous knowledge and ethnobotany, marketing, and others. One symposium paper, "Domestication of the bush mango (*Irvingia* spp.): Some Exploitable Intraspecific Variations in West and Central Africa" by O.L. David is referenced elsewhere in this bibliography.

Doucet, J.L. and Koufani, A. 1997. Etude des Produits Secondaires Végétaux de la Forêt de Kompin (Cameroun): Utilisations, inventaires, régénération, commercialisation, et gestion durable. Travail réalisé dans le cadre du projet << Mise en place de forêts communautaires en périphérie de la Réserve de Faune du Dja (Cameroun) >> financé par la Commission Européenne. Gembloux, Belgium, Faculté Universitaire des Sciences Agronomiques de Gembloux and the Herbarium National du Cameroun. 71 p.

Keywords: Cameroon/Cameroun/commercialization/community forest/food/inventory/medicine/*Ricinodendron*/régénération/*Tetrapleura*/*Trichoscypha*

Notes: This report discusses NTFP's used for food and medicine in the context of a potential community forest near the Dja Reserve to determine which products were important and which were potentially commercial. Some plants were found to be over exploited. Other plants were not commercially viable because they are too useful to the local people for their own needs or they are too sparse. *Ricinodendron heudelotii*, *Tetrapleura tetraptera*, *Trichoscypha* spp. seem to be potentially commercializable.

This report focuses on NTFP use in a single village. The methods were simple. To inventory locally important plants, for example, the researchers walked about 35 kilometers of roads with two men "ayant une bonne connaissance de la forêt et de ses produits." However, the methods, data, and conclusions are clearly and transparently presented.

Dounais, E. 1997. Mission d'expertise ethno-sociologique dans le cadre du Program CUREF: Guinée Equatoriale 13-28 juillet 1997. Rapport Provisoire. Yaoundé, Cameroun: APFT. 19 p.

Keywords: exploitation

Notes: This report documents the author's observations resulting from visits to two sites. Included in the discussion are the current and potential state of NTFP exploitation.

Earth Love Fund: Final Project Report. 1996. Conservation through Cultivation: Limbe Botanic Garden Economic Species Project. Cameroon, Limbe Botanic Garden. 6 p.

Keywords: Cameroon/conservation/economic/Limbe/*P. africana*

Notes: This report summarizes the activities and achievements of the project after 1 year. The goal of the project was to domesticate a number of valuable NTFP bearing species. Achievements cited by the author(s) include establishing trial plots and plantations, supplying local people with planting material, and enhancing species conservation.

Emperaire, L. and Pinton, F. 1993. Ecological and Socio-Economic Aspects of Extractivism on the Middle Rio Negro. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; Hadley, eds. *Man and the Biosphere Series*. Paris: UNESCO. 13: 6.

Keywords: dynamics/food/production

Abstract: Excerpted from the Introduction: "In this example from the Middle Rio Negro, some of the ecological and socio-economic bases of extractivism are identified and extractivism is analysed as a component of the production system. The results presented should be interpreted as investigations of the dynamics, viability and possibilities for change of extractivism as a method of managing the forest."

Evaluating Linkages between Business, the Environment, and Local Communities: Final Stories from the Field. Salafsky, N., ed. 1999. Biodiversity Conservation Network. 219 p.

Keywords: business/drug/ecotourism/enterprises/honey/rattan/sustainability/monitoring

Notes: This book contains 20 stories relating to the experiences of local people and conservation and development workers in developing business enterprises. None of the stories are based on experiences from Africa; however, they describe the opportunities and challenges of a number of businesses including rattan, ecotourism, honey, and drug prospecting. Topics addressed include ecological sustainability, local customs, quality control, monitoring, and local capacity building.

Falconer, J. 1990. The Major Significance of Minor Forest Products—Examples from West Africa. *Appropriate Technology*. 17(3): 13-16.

Keywords: food/Ghana/household economy/market/markets/medicine/rural/urban/women

Abstract: “Forest products are of significance to many people, in both rural and urban areas. Julia Falconer toured villages and markets in Ghana, and talked with people about how they use the forest.”

Notes: This is a discussion for a layperson on how Ghanians, especially low-income people, use and depend on NTFP's.

Fereday, N.; Gordon, A.; and Oji, G. 1997. Domestic Market Potential for Tree Products from Farms and Rural Communities: Experience from Cameroon. NRI Socio-economic Series 13. Chatham, UK:NRI, University of Greenwich. 28 p.

Keywords: Cameroon/demand/domestication/income/inventory/market/marketing/markets/processing/production/research/rural/storage/tenure

Abstract: “This publication summarizes the results of research carried out by NRI in Cameroon during 1995—96 on the domestic market potential for tree products from farms and rural communities. The study arose from concern that agroforestry projects, which generally aim to reduce the pressure on natural forests by planting trees on farmland, were inadequately addressing the associated marketing needs. As a consequence, many of the projects were failing. The research reported here sought to characterize the markets for nontimber tree products (NTTP's) and highlight constraints to the development of markets for traditional and emerging NTTP's. The research in Cameroon was paralleled by a study in the Brazilian Amazon carried out by IFPRI; ODA provided funding for both studies.

The work began with an inventory of products and subsequent identification of marketing chains. Four products were selected as case studies and were used to explore issues relating to valued added domestication and the role of NTTP's as sources of income. The marketing of the four products was well established and appeared to be relatively competitive, in spite of some concerns over lack of information at the farmer level. There was growing demand for the products, apparently matched by increasing supply. The wholesalers, who source the products in the forest fringe communities and sell them on to retailers, were the most dynamic links in the marketing chains.

“The impetus to domesticate NTTP’s seemed always to be farmer-driven and occurred when a product important for subsistence and income needs was not readily available from the forest. However the role of NTTP’s within the farming system is important; they must fit into a complex strategy which includes seasonal smoothing of income, production, and labor needs. Also, tree-planting is a long-term investment which is unlikely to be undertaken if land tenure is insecure. “In conclusion, areas have been highlighted for future research. These areas include technical aspects of cultivation, processing, and storage; identification of products that will be in greater demand as a result of urbanization; and the role of NTTP’s in the livelihood strategies of particularly vulnerable groups (including the landless) in the forest fringe communities.”

Fischer, F.U. 1993. Beekeeping in the Subsistence Economy of the Miombo Savanna Woodlands of South-Central Africa. In: Rural Development Forestry Network Paper. Hobley, M. and Shanks, E., eds. London: ODI. 15c: 1-9.

Keywords: beekeeping/honey/profitability/rural/rural development

Web/URL’s: <http://www.oneworld.org/odi/fpeg/networkpapers15english.html>

Abstract: Excerpted from the Introduction: “This paper which has been drawn from a larger review of beekeeping in the Miombo zone, begins by looking at the place of beekeeping in the subsistence economy. It then goes on to briefly examine the impact of projects which have attempted to increase the productivity and profitability of traditional beekeeping and the integration between beekeeping and forest management.”

Notes: Examples in the paper are from Tanzania and Zambia.

Fondoun, J.M.; Manga, T.T.; and Kengue, J. 1998. *Ricinodendron heudelotii* (Djansang): Ethnobotany and Importance for Forest Dwellers in Southern Cameroon. In: *Proceedings of 2nd International Workshop on African Pear Improvement and Other New Sources of Vegetable Oils*. Kapseu, C. and Kayem, G.J., eds. Yaounde: Presses Universitaires de Yaoundé

Keywords: Cameroon/collection/domestication/ethnobotany/food/income/income-generating/kernel/medicinal/oil content/production/provenance/*Ricinodendron*/rural/yield/wild fruit/fruits

Abstract: “Domestication of indigenous wild fruit trees for their

integration into existing land use systems is aimed at improving the livelihood of rural communities while maintaining plant biodiversity. Such improvement could be in terms of production systems, income generating opportunities or nutritional well-being. An ethnobotanical survey and germplasm collection of *Ricinodendron heudelotii* (an indigenous fruit tree) was carried out in six provinces of the humid lowland forests of Cameroon. Fruit samples were collected at 40—50km distance intervals along the main road network in homegardens, food and cash crop fields, bush fallow, and secondary and primary forests. At each point, samples were collected from trees chosen by farmers. Classical semi-structured questionnaires were used to interview farmers in order to understand the importance of the tree in the community. An average of 100 fruits was collected per tree provenance or accession for germplasm collection and morphological description. A total number of 47 accessions were recorded and seed weight performance calculated per accession. Fruit morphology showed various helium shapes indicating variability among provenances. Seed weight varied significantly among provenances by a difference of 110 g between the highest and lowest yields. Four major uses ranging from food consumption, medicinal, socio-cultural, and soil fertility improvement were derived from the species.”

Fotso, R.C. and Ngnegueu, P.R. 1996. Commercial Hunting and its Consequences on the Dynamic of Duiker Population. Cameroon: ECOFAC.

Keywords: Cephalophus/chassé/duiker/rendement/hunting/chasseur/hunters/yield

Abstract: FRENCH: Pendant la grande saison de chasse dans la région (allant de juillet à novembre), près de 1285 pièges placés en forêt par les 11 chasseurs qui ont accepté de participer à notre étude ont été suivis. Au cours de cette période, un total de 789 individus appartenant à 22 espèces de mammifères ont été capturés, avec 85% de ce total représenté par le genre *Cephalophus*.

L’effort de piégeage augmente de la zone 1 proche du village vers la zone 3 proche de la partie centrale de l’aire protégée. Cet effort apparaît similaire dans les forêts secondaires à travers les trois zones. Il apparaît également que près de 65% des pièges sont installés dans le sous bois de la forêt primaire sur terre ferme. Le taux apparaît très élevé en zone 3 et forêt primaire comparé aux zones 1 et 2 ainsi que les autres types de formations végétales. Le nombre d’individus tués est fonction de l’effort de piégeage. Pour un effort de piégeage similaire, le nombre d’animaux

tués est plus élevés en forêt secondaire que dans les autres types de formations végétales. Trois espèces de céphalophes *Cephalophus callipygus*, *C. dorsalis* et *C. monticola* sont plus affectés par l'activité de chasse. Les individus appartenant à ces trois espèces contribuent à près de 75% du total des animaux tués dans la région.

L'analyse des rendements montre que les pièges sont très productifs durant les deux premières semaines qui suivent leur installations sur le terrain. La productivité chute graduellement et atteint la valeur minimale au bout de 60 jours. Après quelques temps, elle s'élève à nouveau.

L'augmentation du nombre d'individus capturés après la période de productivité minimale permet de suggérer un processus actif de changement de population, résultant de la recolonisation des espaces libérés par des individus provenant des secteurs adjacents aux lignes de pièges. Ceci permet de constater que les perturbations causées dans la zone de piégeage peuvent s'étendre sur des superficies de plus en plus larges. Une autre conséquence de la technique populaire de chasse est que le nombre de femelles tuées est presque identique au nombre de mâles. Un grand nombre de femelles tuées était en gestation ou allaitant les jeunes. Il apparaît à partir de tous les résultats présentés dans notre étude que le niveau de prélèvement actuel dans la région n'est pas soutenable.

ENGLISH: "Between July and November 1995, we monitored a total of 1,285 traps set up in the forest by a group of 11 hunters who volunteered to participate in the study. During this period, a total of 789 individuals from 22 species of mammals were killed with the genus *Cephalophus* contributing almost 85 percent of the catch.

"The trapping effort is increasing from the first zone near the village towards the third zone close to the central part of the protected area. This index appears to be relatively similar in secondary forests across the three zones. It also appears that about 65 percent of the traps are distributed in the primary forest undergrowth. The capture rate appears to be higher in zone 3 and in areas of primary forest compared to zone 2 and zone 1 as well as other habitat types. It is apparent that the number of individuals killed is a function of the trapping effort. For a similar trapping effort, the number of kills is likely to be more important in secondary forest than in any other habitat type. Three species of duiker (*Cephalophus callipygus*; *Cephalophus monticola*; *Cephalophus dorsalis*) appear to be most affected by hunting. Individuals of these

three species contribute about 75 percent of the total number of mammals killed in the area.

“It appears from various records that traps are very productive during the first two weeks in the field. This productivity drops gradually to reach a minimum value just after about 60 days. After some time, the yield of the traps start to rise again. The increase in the number of individuals captured after a very low period strongly suggests an active process of population turnover, as some individuals from adjacent territories are attempting to recolonize empty spaces left by dead animals. The analysis of the age structure in these three species shows that a large number of subadults are involved in the process of recolonizing newly free spaces. This is an indication that disturbances caused within the hunting zone can affect a much larger sector caused by the subsequent population adjustment or turnover. Another consequence of this popular hunting method is the fact that an equal number of female and males are killed.

“A fairly good number of females captured were pregnant or were feeding young, underlining an indirect consequence of hunting activities: high mortality of young which seriously impact the reproductive potential of the wild population making it more difficult for many of the prey species to compensate losses from hunting. It appears from the results that the level of harvesting in the region at present is not sustainable.”

Notes: Publication date is estimated.

Fuashi, N.A. 1997. Production and Marketing of NTFP's in the Korup Project Area Cameroon, and Cross Border Trade with Nigeria. Paper Presented at the International Workshop on the Domestic Market Potential of Non Tree Timber Products (NTTPs). 1997 January 24. Limbe Botanical Garden, Cameroon. Eyumojock, Cameroon, Korup Project. 34 p.

Keywords: Cameroon/household/household income/income/Limbe/market/marketing/national park/production/trade/economic/collection/bush mango/*Irvingia*/*Garcinia*/eru/Gnetum/markets/economic potential/*Irvingia gabonensis*/Nigeria

Abstract: “This work, carried out in the Ejagham Forest Reserve between August 1994 and April 1995, aimed at identifying the economic opportunities of nontimber forest products (NTFP) in the support zone villages of the park that can be developed and promoted.

“The Ejagham Forest Reserve is one of three forest reserves that fall within the support zone of the Korup Project. It is located strategically along Cameroon-Nigeria’s southwestern border and shares a common ecological zone with the Cross River National Park in Nigeria.

“Administering questionnaires, semistructure interview, field visits to harvesting and collection sites, and informal discussion with NTFP’s user groups formed the bedrock of the approach used.

“Highlights of the results include a checklist of NTFP’s for the Ejagham Forest Reserve area with the following identified with economic potentials that can be developed and promoted.

- (1) Bush mango: (i) Sweet bush mango (*Irvingia gabonensis*), (ii) Bitter bush mango (*Irvingia wombulu*).
- (2) Chewing sticks: (i) Igbo chewing sticks (*Garcinia mannii*). (ii) Yoruba chewing sticks (*Masularia accuminata*).
- (3) Eru: (*Gnetum africanum*).
- (4) Hausa sticks: (i) (*Carpolobia lutea*). (ii) (*Carpolobia alba*).
- (5) Bush meat.

“The collection, harvesting, and marketing; transportation and utilization of these products is very much dependent on the two seasons (wet and dry) that dominate the climate of the Ejagham Forest Reserve area. The market conduct and performance of these products is influenced to a great extent by the Nigerian marketing system.

“In a nutshell, about 60 percent of a household’s income in the study area is generated from the domestic and cross border trade in NTFP’s. The main channel for NTFP’s markets from the Cameroon border villages is found in nearby Nigeria. This suggests that, any development of these products (NTFP’s) should be done with the Nigerian marketing system in view.”

Gakou, M.; Force, J.E.; and McLaughlin, W.J. 1994. Non-timber Forest Products in Rural Mali: A Study of Villager Use. *Agroforestry Systems*. 28: 213-226.

Keywords: economic/forest management/gender analysis/household/income/native species/policy/research/rural/women/yield

Abstract: “Malian Forest Service activities and policies have evolved since the beginning of colonialism under the assumption that forests and

their products are the property of the government. Today, the importance of involving local people in forest management is recognized. The purpose of this research was to determine the range of nontimber forest products local people use either for direct consumption or for income generation and to identify the trees and shrubs that yield these products in natural forests, fallow lands, and crop fields. A gender analysis of the data was also conducted. The data were collected from face-to-face structured interviews using open-ended questions of 92 randomly sampled households in six Malian villages. One-half of the interviews were conducted with women and the other half were with men. The study identified 55 different nontimber forest products produced by 108 plant species. Almost all (99%) of the products identified are used for personal consumption, whereas 68 percent of the products are also used to generate income. Products such as firewood, leaves for sauces, shea nuts for oil and butter, seeds for condiments, and nuts and seeds for soap are the most frequently mentioned products collected by women. Different categories of products like utensils and house materials, animal feed, and construction materials (thatch, poles, mats) are the products most frequently collected by men. Ninety percent of the products collected are found in the natural forests; 63 percent are collected from trees on fallow lands and 51 percent from scattered trees in crop fields. Forest Service support of villagers using nontimber forest products would create an economic relationship between the forest and the local people. This is essential for the protection of the forest because people will safeguard their interests.”

Gautier, D. 1996. *Ficus* (Moraceae) as Part of Agrarian Systems in the Bamileke Region (Cameroon). *Economic Botany*. 50(3): 318-326.

Keywords: agroforestry practice/Cameroon/Cameroun/croissance/cuttings/ethnobotany/*Ficus*/growth/indigenous knowledge/production/research

Abstract: ENGLISH: “This paper considers the altitudinal zonation of *Ficus* on the southern slopes of the Bamboutos Mountains, Cameroon, and attempts to understand how these species have been appropriated by the Bamileke people. Five commonly used species of *Ficus* are propagated using pole cuttings. This genus contains important species in the farming system that have specific growth and developmental requirements. They mark the land ownership boundaries, are symbolic trees that give shelter to the lineage gods, and are important parts of fence structure. They are incorporated into and contribute to the management of the territory. The landscape is criss-crossed with hedges that allow the

integration of cropping and breeding activities. Their rapid growth also constitutes an important source of firewood and cuttings. The Bamileke's long use of and interest in the *Ficus* genus is demonstrated by the variety of indigenous names given to its species. The study of these names has provided the structure for guiding this ethnobotanic research."

FRENCH: Tout en situant les *Ficus* dans leur distribution altitudinale sur les versants méridionaux des Monts Bamboutos (ouest Cameroun), cet article se propose de montrer comment des espèces de *Ficus* ont été appropriées par la population Bamiléké. Cinq espèces d'usage commun sont multipliées par des techniques de macro-bouturage. Elles ont des qualités de développement spécifiques qui en font des éléments dominants des systèmes de production Bamiléké. Elles ont un rôle dans l'appropriation de la terre et dans l'organisation du territoire, avec un maillage de haies qui sépare l'espace cultivé et les pâturages. Elles fournissent du bois de feu et des boutures grâce à leur vitesse de croissance. Et elles peuvent avoir une valeur symbolique et être un abri aux dieux des lignages. L'intérêt que la population Bamiléké porte à ce genre, et les usages qu'elle en, se retrouve dans leur dénomination linguistique locale qui a été le fil conducteur de cette recherche ethnobotanique.

Guedje, N.M. 1996. Evaluation Ecologique de Quelques Produits Forestiers Non Ligneux (PNFL) de la Région de Bipindi - Akom II: Abondance, Distribution et Impact des Récoltes sur les Peuplements. Cameroon, Program Tropenbos Cameroon. 37 p.

Keywords: Aframomum/Cameroun/croissance/Garcinia/régénération/fruits/melegueta

Abstract: Le présent travail qui s'inscrit dans le cadre des activités du Programme TROPENBOS CAMEROUN dans la région de Bipindi - Akom II, porte sur l'étude des conditions de croissance, l'abondance, la distribution spatiale et l'impact de l'exploitation par les populations sur la croissance et la régénération de *Garcinia lucida* Vesque., *Aframomum citratum* (Per. ex Oliv. et Hanb.) K. Schum. et *Aframomum melegueta* (Rosc.) K. Schum., trois essences forestières secondaires occupant une place prépondérante dans la vie des populations locales de cette région de part leur multiplicité et leur diversité d'usage, ainsi que des revenus qu'ils génèrent.

Cette étude a été abordée dans un premier temps par une enquête auprès des populations. Elle a permis de recenser et de localiser les sites potentiels de récolte de ces ressources, dans les localités d'Ebom et de Bidjouka.

L'inventaire écologique de la seconde étape a montré que : *Garcinia lucida* Vesque. (ou Essok en langue boulou) se développe en formant des taches de peuplement (environ 58 tiges par ha) sur les versants rocheux et non-rocheux des collines, en association avec d'autres espèces végétales. Cette essence montre une nette préférence pour les végétations non-perturbées par rapport aux végétations perturbées ou secondaires. La technique de prélèvement de l'écorce, lorsqu'elle est modérée, s'accompagne d'un traumatisme que la plante peut surmonter et poursuivre son développement. Par contre, lorsque les surfaces d'écorces qui sont prélevées sont importantes, et/ou en forme d'anneau, il en résulte une dégénérescence de l'arbre qui affecte également le développement et la reproduction future de l'espèce. Une autre technique, la coupe de l'arbre à une certaine hauteur du sol (1 m environ), entraîne une réitération traumatique permettant à la plante de se régénérer. Le diamètre des tiges à exploiter constitue un facteur important dans le processus de cicatrisation des entailles, et les observations ont montré que les tiges adultes de diamètre compris entre 10 et 15 cm sont les plus résistantes aux prélèvements de l'écorce. L'exploitation forestière industrielle et l'agriculture affectent également la disponibilité de cette ressource.

Aframomum citratum (Per. ex Oliv. et Hanb.) K. Schum. (ou Mvolong en langue boulou) pousse en touffes très denses dans les jeunes jachères et les pistes forestières ensoleillées. La récolte des fruits n'affecte pas la croissance et la régénération de cette essence qui se multiplie massivement de manière végétative.

Aframomum melegueta (Rosc.) K. Schum. (ou Ndong en langue boulou) serait rare en forêt naturelle dans la zone d'étude. Aucun informateur n'a pu indiquer un peuplement naturel dans la végétation des deux villages faisant l'objet de l'étude. C'est une essence cultivée dans les milieux ombragés tels que les cacaoyères. Elle se reproduit végétativement. La multiplication par voie sexuée semble possible. Ainsi, la récolte des fruits n'a pas grand impact sur sa croissance et sa régénération.

Notes: There is an additional 12 pages of Annexes showing species lists and size class distribution data.

Guedje, N.M.; van Dijk, H.; and Nkongmeneck, B.A. 1999. Ecologie et exploitation de quelques produits forestiers non-ligneux (PFNL) de la forêt humide du sud-Cameroun. Paper presented at Séminaire FORAFRI de Libreville - Session 3 Produits de la Forêts, 1999, at Libreville, Gabon. 17 p.

Keywords: Aframomum/Cameroun/CAR/exploitation/Garcinia/RCA/ecologie/durabilité/fruits/melegueta

Abstract: Le présent travail se propose d'évaluer l'abondance et la distribution, d'examiner les différentes pratiques de récolte de l'écorce et des fruits et d'avoir des indications quant à leur impact sur la structure des peuplements de *Aframomum citratum*, *Aframomum melegueta* et *Garcinia lucida*. Ces trois essences fournissent des PFNL fréquemment utilisés et commercialisés dans la région du sud-Cameroun. L'étude montre que *A. melegueta* est cultivée dans les milieux ombragés des cacaoyères. *A. citratum* pousse en touffe très dense dans les jeunes jachères et les pistes forestières abandonnées. La récolte des fruits de ces deux espèces affecte très peu la plante ou le peuplement car elles se reproduisent par les rhizomes et les graines. *Garcinia lucida* est une espèce dioïque des pentes et des bas-fonds humides des forêts peu perturbées au-dessus de 500 mètres d'altitude. Elle y forme des peuplements de plus de 58 tiges adultes par hectare, sur des étendues de 2 à 3 km². L'écorce et la graine possèdent des vertus médicinales et servent à la fermentation du vin de palme ou de raphia. L'écorce est prélevée sur des tiges sur pied à l'aide d'une machette ou d'une massue. Une autre pratique consiste à couper l'arbre à hauteur du pied avant l'exploitation. Les troncs sont fréquemment cernés et les conséquences qui en résultent sont le dessèchement des tiges et une mortalité élevée dans les sites. D'où la nécessité de développer des stratégies de gestion rationnelle pour garantir la durabilité d'exploitation de cette essence. Les études ultérieures porteront sur la détermination des techniques et intensités optimales de prélèvement de l'écorce, ainsi que l'estimation des taux d'extraction écologiquement sains.

Notes: Publication date is estimated.

Gulf of Guinea Conservation Group, Gulf of Guinea Islands' Biodiversity Network website. Hosted by Bahnhof ST, São Tomé.

Web/URL's: <http://www.ggcg.st/index.shtml>

Contact/Web Master: info@ggcg.st

Keywords: conservation/Equatorial Guinea/website

Abstract: "This website aims to provide information about the biodiversity, and its conservation, of the four Gulf of Guinea islands of

Bioko, Príncipe, São Tomé, and Annobón.”

Notes: This website contains up-to-date reports on the conservation of the islands’ flora and fauna. It is searchable and includes a links page.

Harris, D. J. 1996. A Revision of the Irvingiaceae in Africa. *Bull. Jard. Bot. Nat. Belg.* 65: 143-196.

Keywords: *Irvingia*/taxonomy

Abstract: “A taxonomic revision of the *Irvingiaceae* is presented. Three genera *Desbordesia* (1 species), *Klainedoxa* (2 species), and *Irvingia* (6 species) are recognized. Standard herbarium characters are not very useful in the identification of the species of *Irvingia*. Additional field characters and, in particular, fruit characters facilitate identification.”

Hladik, A. 1994. Valorisation des Produits de la Forêts Dense autre que le Bois d’Oeuvre. Conservation et Utilisation Rationnelle des Écosystèmes Forestiers en Afrique Centrale Composante République Centrafricaine. Projet ECOFAC. 57 p.

Keywords: Cameroun/collection/conservation/Dacryodes/food/Gabon/insects/medicinal/plantes médicinales/production/Pygmées/RCA/research/femmes/medicinal plants/Safoutier/fruits/valorisation/République Centrafricaine/Dacryodes edulis

Abstract: Excerpted from the Summary: “Cette mission d’appui, effectuée dans le cadre du program ECOFAC en RCA, avait pour objectifs la valorisation des produits de la forêt dense autres que le bois d’oeuvre. La nécessité d’obtenir des données précises sur la zone forestière de Ngotto impliquait une étude locale sur les interactions entre la population et la forêt. Nous avons donc consacré notre temps de mission essentiellement à la région des villages de Ngotto et Poutem, localisés à la limite Nord de la forêt de Ngotto, là où est implanté le centre ECOFAC depuis 1992. Nous avons pu ainsi intensifier les contacts avec les habitants autochtones (les villageois Bofi et les Pygmées) ainsi qu’avec les nouveaux venus attirés par le développement d’ECOFAC.

“Plusieurs types d’enquêtes et de relevés ont été effectués:

“Présentation de photos de plantes pour identification et commentaires sur les usages par les villageois et les Pygmées. Cette collection de photos provient d’un fond documentaire accumulé au cours de séjours dans d’autres forêts d’Afrique Centrale, notamment au Gabon, au Cameroun et en Centrafrique (région de Bagandou et des villages de Metté et Zomia, en Basse Lobaye).

Identification des produits au cours des séances de troc journalier entre les Pygmées et les villageoises.

Relevés semi-quantitatifs des produits forestiers observés le long de transects dans les différentes zones de la forêt de Ngotto.

Relevés des ressources disponibles (plantes cultivées et adventices utiles) dans trois plantations de cultures vivrières avec 3 femmes dans 3 situations différentes : a) habitante de Ngotto, de langue bofi, cultivant du manioc pour son autoconsommation et pour la vente; b) femme d'un employé ECOFAC, d'origine Mandja qui a acheté une plantation de manioc; c) une femme dont la famille paternelle est de Ngotto et dont le mari travaille à ECOFAC et qui cultive le manioc pour sa consommation familiale.

Relevés des arbres et commentaires sur leurs usages dans les villages de Ngotto et de Poutem.

Visite commentée de la plantation d'Alphonse Lossé à Poutem et échanges de vues avec son propriétaire.

Mise au jour d'une ancienne plantation de safoutiers (*Dacryodes edulis*).

"L'ensemble des résultats de ces inventaires a permis d'établir une liste des espèces utiles classées par catégories de produits: arbres à chenilles comestibles, plantes oléagineuses ou féculents de base, fruits, graines, feuilles-épinards, plantes médicinales ou autres usages divers. Les "nouveauautés" de Ngotto ont été mises en évidence.

"Nous devons prendre en compte la différence de situation et de responsabilités entre les hommes et les femmes quant à la gestion de la production. Les recommandations que nous proposons s'appuient d'un point de vue social sur la valorisation du rôle de ces acteurs et d'un point de vue technique, sur les principes de base de l'agroforesterie.

"Pour répondre aux interrogations relatives au développement économique, plutôt que d'envisager une intensification du système de troc basé sur la cueillette en forêt - qui risque d'entraîner la disparition de certaines espèces - il semble indispensable d'installer des systèmes de cultures agroforestières proches des villes, bourgs et villages, par des techniques adaptées aux différentes situations."

Notes: Study recommendations include establishing tree nurseries of forest species for planting in agroforestry systems, the introduction of

live fences; and additional research on development cycles of edible insects and little known food and medicinal plants.

Hladik, A. and Dounais, E. 1993. Wild Yams of the African Rain Forest as Potential Food Resources. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; and Hadley, M., eds. *Man and the Biosphere Series*. Paris: UNESCO. 13: 14.

Keywords: agriculture/Cameroon/dynamics/food/Gabon/historical/production/research/Central African Republic/pygmy

Abstract: Excerpted from the Introduction: "The first survey of yam density and production in tropical humid forest (Hladik *et al.*, 1984) was conducted in Gabon and the Central African Republic, thanks to the expertise of the Aka pygmies who showed the research team how to locate and identify otherwise hidden yams. These results have been complemented by a study in south Cameroon by one of us (E. D., with the help of the Baka and Bakola Pygmies).

"By analyzing the results of these surveys together, in this chapter we examine whether or not the forest contains a large enough variety and quantity of yams - with adequate nutritional value - to serve as a staple food enabling forest populations to live independently of agriculture. We then discuss the spatial distribution patterns of yams, which result from forest dynamics, forest types, geographical areas and historical influences, and the possible connection between the density of yams in a forest and the presence or absence of hunter-gatherers."

Hunting/Bushmeat Bibliography website. Hosted by Bushmeat Project, Hermosa Beach, California.

Web/URL's: <http://biosynergy.org/bushmeat/biblio.htm>

Contact/Web Master: bushmeat@biosynergy.org

Keywords: bibliography/hunting/commerce

Abstract: "You are invited to use and contribute to a working bibliography we are developing on hunting and bushmeat commerce in West and Central Africa. With over 200 entries, this may already be the largest organized reference list on such topics. However, it is far from finished. More input is needed to make this a comprehensive tool that can be used to substantiate and direct programs to stop the commercial slaughter of endangered animals for their meat."

Ichikawa, M. 1993. Diversity and Selectivity in the Food of the Mbuti Hunter-Gatherers in Zaire. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; Hadley, M., eds., *Man and the Biosphere Series*. Paris: UNESCO. 13: 10.

Keywords: food/hunters/hunting/Zaire

Abstract: Excerpted from the Introduction: "Of the Mbuti groups living in Ituri, the Sudanic-speaking Mbuti, the Efe, are predominantly archers and live in the northern and northeastern parts of the forest where there is no single species dominant forest. The Bantu speaking net hunters live in the central and southern parts where both mixed and single species dominant forests are found. Various researchers (Harako, 1976; Milton, 1984; Roscoe, 1990) have tried to explain the distributions of archers and net hunters in relation to the difference in the environmental conditions between the two forest types, with limited success. More study of the differences in food resources available to people in these two types of forest is necessary for their potential as human habitats to be fully understood.

"In agriculture, the domestication of the staple food crops was boosted by the Green Revolution that promoted food security and poverty alleviation, but now there is an opportunity to follow this with a Woody Plant Revolution for the "Cinderella" species overlooked so far by science and industry. This should be targeted at the diversification of agriculture, environmental rehabilitation and the generation of cash by resource-poor farmers. This approach, which started in the 1970's, has recently gathered momentum. This paper presents progress, to date, within ICRAF, a review of the expected gains in product yield and quality through domestication; the biological possibilities; and the priorities and pitfalls needed to be considered in moving this approach forward.

"In conclusion, a number of important environmental, socio-economic, and policy questions associated with the domestication of tropical trees are raised as examples of topics for research."

Notes: Publication date is estimated. Included are some examples from Cameroon. There are six pages of references.

Incomes from the Forest: Methods for the Development and Conservation of Forest Products for Local Communities. Wollenberg, E. and Ingles, A., eds. 1999. CIFOR and IUCN. 227 p.

Keywords: conservation/enterprises/impacts/income/profitability/sustainability/sustainable harvest

Notes: This book examines at community-level NTFP enterprises. Topics include the role of NTFP's in conservation and development, a framework to assess the opportunities and constraints in NTFP systems, feasibility and sustainability assessment of NTFP enterprises, profitability assessment, determining sustainable harvest levels, and assessing the social impacts of NTFP projects.

Index of *Canopée* website. Hosted by ECOFAC.

Web/URL's: <http://www.ecofac.org/Canopeel/>

Keywords: website

Notes: This website contains direct links to past issues of *Canopée* magazine, a bulletin on the Central Africa environment.

International Institute for Environment and Development website. Hosted by International Institute for Environment and Development, London.

Web/URL's: <http://www.iied.org>

Contact/Web Master: mailbox@iied.org

Keywords: research/policy/economic/community groups/data base/agriculture/rural/website

Abstract: Excerpted from About Us: "IIED is an independent, non-profit organisation which promotes sustainable patterns of world development through collaborative research, policy studies, consensus building and public information.

"With a focus on issues of equity and justice, and the rights and needs of poor people, the Institute works in an interdisciplinary way, addressing the connections between economic development, the environment and human needs.

“IIED’s principal aim is to improve the management of natural resources so that communities and countries of the South can improve living standards without jeopardising their resource base. Its work is undertaken with, or on behalf of governments and international agencies, the academic community, foundations and non-governmental organisations, community groups and the people they represent. “IIED has headquarters in London, a sister organisation in Latin America and an associated institution in North America. Close collaboration is maintained with partner organisations in other countries.”

Notes: This website contains a bookstore, databases, and research sections on forestry, biodiversity, agriculture, and rural livelihoods.

Iwu, M.M. 1998. Proposal to CARPE Submitted by the Bioresources Development and Conservation Program. Silver Spring, MD: BDCP. 9 p.

Keywords: Cameroon/conservation/data base/drug/economic/ethnobotany/Gabon/market/marketing/markets/medicinal/medicine/pharmaceutical/processing/production/proposal/rural/trade/medicinal plants/search

Abstract: “Plants and herbal products have been used as a major component of therapeutic agents and a source of chemical diversity in drug discovery programs. In recent years, renewed interest has been shown in the use of medicinal plants and traditional medicine as phytomedicines and nutraceuticals. Pushed by the accelerating search for new active ingredients, pharmaceutical companies are actively screening medicinal plants for potential new active substances. Related sectors, such as cosmetics, flavors, and fragrances industries worldwide, are also increasingly looking at the utilization of plants and herbs. The flora of Central Africa are particularly rich in plant materials with medicinal or other useful properties. Several bioprospecting projects are currently being conducted in parts of Central Africa, and the contractual arrangements are such that crude plants are collected from the region and exported overseas for processing. The financial returns to the source countries have been minimal due to the low value given to crude plant materials in drug discovery and development. Since the Rio Conference in 1992, companies are under increasing pressure to give appropriate compensation for access to biological resources. It has been argued that rather than exporting unprocessed vegetable drugs and crude extracts, it

would be more profitable for developing countries to process the plant materials themselves as phytomedicines and other standardized but low-tech herbal products.

The fundamental issue for decisions for or against bioprospecting in comparison with phytomedicine manufacturing lies in the overall economic assessment of drug development, the technological capacity, and capability of source countries to produce phytomedicine and the relative impact of the enterprise on conservation of biological diversity.

“The project will aim to 1) evaluate the status of plants from Central Africa as sources of raw materials for drug discovery and assess the current bioprospecting activities in the region, 2) compare the net returns to source countries from the trade on unprocessed medicinal plants and extracts with the potential value of processed phytomedicines and other herbal products, 3) assess the available capacity and capability in Cameroon (and, if possible, Gabon) to process medicinal plants as phytomedicines, and 4) assess the possible impact of the phytomedicine industry to the conservation of biodiversity in the source countries. The project will evaluate the marketing chain (from forest, through the village to the cities) of various methods of medicinal plant utilization and assess the relative financial returns and other nontimber monetary benefits to the source community, region, and country. Rapid appraisal of national and regional capabilities and capacities to undertake commercially feasible phytomedicine production projects. Prices and volumes of the major medicinal plants currently traded in international markets will be collected and compared to the value which can be captured by processing the plants into finished products. The methodology requires only limited field surveys and interviews since the project will utilize existing database on the ethnobotany of the region and the sample frames of producers and traders of herbal products in previous BDCP projects.

“This project will provide data to support CARPE’s program of creating economic incentives to rural communities to support biodiversity conservation. It will also contribute directly to CARPE’s Community Conservation program by identifying conditions necessary for the local community members to participate in the cultivation of high-value nontimber forest products used as phytomedicines.”

Notes: This is 1-year CARPE proposal for \$19,800.

Iwu, M.M. and Laird, S.A.. 1998. *Drug Development and Biodiversity Conservation in Africa: Case Study of a Benefit-Sharing Plan*. Silver Spring, MD: ICBG. 29 p.

Keywords: benefit sharing/Cameroon/conservation/drug/medicinal/pharmaceutical/website/Nigeria

Web/URL's: <http://www.bioresources.org>

Notes: This paper explains the African ICBG's approach to benefit sharing in drug prospecting and drug development emphasizing the importance of "process" benefits as well as potential long-term royalties. The authors concentrated on Cameroon and Nigeria. The authors can be contacted via the website.

Johnson, D.V. 1997. *Non-wood Forest Products: Tropical Palms*. Bangkok: FAO. 166 p.

Notes: This book has a short section devoted to "Africa and the western Indian Ocean region" where it touches on threatened and nonthreatend species. It provides a comprehensive overview of the *Palmae*.

Johnson, E.T. and. Johnson, T.J. 1976. *Economic Plants in a Rural Nigerian Market. Economic Botany*. 30: 375-381.

Keywords: economic/rural/market/women/storage/fruits/medicinal/medicinal plants

Abstract: Excerpted from the Introduction: "This paper presents information gathered by one of the authors during the course of a study of local market women (E.T. Johnson, 1973). Data were collected over a twelve-month period (January 1972 to January 1973). Since the list includes only those plants marketed in a fresh, identifiable form, it does not present an entirely accurate range of plants used. Storage of their products clouds the seasonal range of some crops. Many commodities are sold more commonly in a processed form than in their fresh state. Many plants, particularly minor fruits and medicinal plants, are rarely traded, although they may be widely used. These limitations to the data are mentioned again below under those specific crops to which they apply."

Karsenty, A. and Joiris, D.V. 1976. Les Systèmes Locaux de Gestion dans le Bassin Congolais. Washington, DC: Innovative Resources Management. 62 p.

Keywords: agricole/Amélioration/Cameroun/CAR/chassé/commerce/Congo/conservation/exploitation/écotourisme/élites/femmes/foncière/Guinée Equatoriale/impacts/médiation/parc/participation/plantes médicinales/provenance/RDC/rural/rurale/tenure/urbain/website

Web/URL's: <http://carpe.gecp.virginia.edu/products/products2.asp>

Abstract: Excerpted from the Introduction "On trouvera ainsi dans les pages qui suivent une première partie consacrée aux principales caractéristiques des communautés rurales; ensuite, dans le chapitre suivant, une typologie des projets de gestion durable inspirée de celle de Nguingiri (1997) et enfin une analyse de l'impact de ces projets, particulièrement en ce qui concerne la cartographie participative."

Notes: This report includes a discussion on the endogenous and exogenous characteristics of "local forest resource management systems." NTFP's are shown as an integral part of these systems. This is available in PDF format on the website indicated.

Kemples, M. 1995. Etude du Commerce en Produits Forestiers Non-ligneux dans la Région Bipindi-Akom II du Sud du Cameroun. The Netherlands, Departement de Foresterie, Université Agronomique de Wageningen. 44 p.

Keywords: Cameroun/commerce/conservation/mangue sauvage/marché/production

Abstract: Le développement de méthodes et stratégies de gestion de la forêt de la zone de recherche du Program Tropenbos Cameroun (PTC) nécessite l'intégration des différentes formes d'utilisation des ressources forestières. Les Produits Forestiers Non-Ligneux (PFNL) ont jusqu'à récemment rarement été sujets de recherche. Les PFNL sont pourtant communément utilisés par les populations locales. Dans le but de contribuer à une meilleure compréhension de l'utilisation et de l'importance des PFNL, le commerce en PFNL dans le sud du Cameroun est traité dans cette étude.

L'information primaire de cette étude a été rassemblée auprès de grossistes et détaillants de marchés de Kribi, Ebolowa et Douala avec l'aide d'enquêtes. L'information secondaire provient de littérature et de la recherche de Van Dijk.

Les renseignements ont servi à décrire les PFNL étudiés et le système commercial et à déterminer les indicateurs du potentiel commercial des PFNL et du fonctionnement du système commercial.

Potentiel commercial des PFNL.

Douze PFNL dont les espèces figurent dans la zone de recherche selon Van Dijk (1994) et qui ont été rencontrés aux marchés visités sont sujets de l'étude. La plupart des PFNL étudiés est utilisée comme condiment dans des plats traditionnels par différentes ethnies de la zone de recherche du PTC et se consomme en petite quantité.

Afin de déterminer l'importance économique actuelle des PFNL, les bénéfices annuels des PFNL ont été calculés pour les marchés visités de Kribi et Ebolowa. La *mangue sauvage*, le *njansan* suivis du *ndong* et *mbongo* procurent nettement plus de bénéfices que les autres PFNL étudiés.

La durée de conservation de produits doit être suffisamment longue pour permettre le transport du lieu de production aux consommateurs et dans le cas de production saisonnière (de la majorité des PFNL étudiés), pour disposer des produits entre les saisons. Les neuf PFNL qui sont saisonniers se conservent suffisamment longtemps. *L'okok* est un PFNL non-saisonnier qui se conserve seulement durant une semaine et l'organisation du commerce de ce PFNL doit pour cela explicitement tenir compte de sa durée de conservation.

Le degré de substitution possible des PFNL est étudié pour voir si leur potentiel commercial est menacé par un produit cultivé ou synthétique. Le potentiel commercial du *poivre sauvage* est menacé par un substituant cultivé. Les deux autres PFNL pour lesquels un substituant est mentionné sont la *mangue sauvage* et le *njansan* qui pourtant procurent le plus de bénéfices annuels.

La relation entre les ethnies et la consommation de PFNL est considérée comme indicateur puisqu'elle peut être un obstacle à une expansion commerciale en PFNL. L'étude de cet aspect est seulement faite globalement. Les résultats semblent indiquer que la consommation des PFNL n'est pas fortement liée à l'ethnie.

Fonctionnement du système commercial: les marchands en gros de PFNL de la zone de recherche du PTC sont situés à Douala et à Yaoundé. Kribi et Ebolowa ont uniquement des marchés au détail. Les

marchés ont lieu tous les jours. L'entreprise privée domine. Deux types d'entreprises ont été distinguées: les généralistes qui ont une gamme de PFNL relativement large et d'autres produits ménagers et les spécialistes qui ont un PFNL ou un PFNL combiné avec des produits cultivés.

Les flières commerciales dont dépendent les détaillants et grossistes ont été tracées afin de voir comment l'approvisionnement a lieu. Ceci permet de conclure que les approvisionnements se font souvent dans la même ville mais que les vendeuses de Kribi s'approvisionnent plus souvent à Douala que les vendeuses d'Ebolowa le font à Yaoundé.

Une description de l'efficacité du système commercial fait partie de l'étude. Le nombre de vendeuses paraît grand mais les renseignements ne permettent pas de conclure si ceci dérange le fonctionnement du système commercial. La moitié des plaintes au sujet de la vente concerne les petites quantités vendues. Les sujets des autres plaintes sont traités comme indicateur.

Puisque les marchands dépendent des moyens de transport publics, les renseignements concernant cet aspect sont traités. Un tiers de problèmes au sujet de l'achat de marchandise concerne le transport. Les problèmes mentionnés sont les frais de transport élevés, la perte de bagages ou les dégâts causés à la marchandise lors du transport.

La variation des prix est forte au cours de l'année pour neuf des douze PFNL étudiées. Cet indicateur du fonctionnement du commerce signale donc un point faible dont il faut tenir compte si l'expansion du commerce est envisagée.

Un des problèmes du commerce en PFNL fréquemment cité dans la littérature est son insécurité. La majorité des vendeuses interrogées, aussi bien les grossistes que les détaillantes, diminue les risques en vendant une gamme de produits.

Les indicateurs du potentiel commercial des PFNL étudiés sont favorables à une expansion de l'exploitation commerciale pour la plupart des PFNL. Le système commercial par contre comprend des points faibles qui doivent être améliorés.

Notes: This paper also contains 25 pages of annexes showing data from the study.

Kengue, J. 1990. Le Safoutier (*Dacryodes edulis* (G.Don) H. J. Lam): Première Données sur la Morphologie et la Biologie. Docteur de 3ème Cycle, Université de Yaoundé, Yaoundé. 150 p.

Keywords: alimentaires/Amélioration/croissance/*Dacryodes*/Morphologie/pollinisation/production/Safoutier/fruits/*Dacryodes edulis*

Abstract: La safoutier (*Dacryodes edulis* (G. Don) H.J. Lam) est un arbre fruitier et oléifère d'origine africaine, ayant des potentialités alimentaires, économiques et industrielles actuellement sous-exploitées. Sa culture, uniquement traditionnelle se heurte à un certain nombre de contraintes dont les plus importantes sont:

- La prédominance de pieds mâles et hermaphrodites peu productifs sur les pieds femelles qui assurent la quasi-totalité de la production;
- La réponse non-favorable de la plante aux techniques de multiplication végétative classiques;
- Les fluctuations de productions annuelles des pieds femelles et les variations saisonnières de sexe chez les arbres mâles et hermaphrodites.

Ce travail qui analyse et tente d'interpréter certains aspects de la morphologie et de la biologie de la plante, a montré que le safoutier est une espèce monopodiale à croissance et à ramification, rythmiques; à axes tous identiques et orthotropes et à sexualité latéral (modèle architectural de RAUH). Toutes les unités de croissance ne sont pas ramifiées; la périodicité de la ramification est de 3 à 4 unités de croissance suivant la vigueur de l'axe. Le safoutier présente de multiples possibilités de "réitération" adaptatives et traumatiques pouvant être exploitées aux fins de multiplication végétative et de conduite de l'arbre.

La régime de reproduction est allogame avec quelques possibilités d'autogamie chez les arbres mâles et hermaphrodites. Aussi bien chez les arbres mâles et hermaphrodites que chez les arbres femelles, l'anthèse commence tôt vers 4 heures du matin et s'achève vers 9 heures. Les taux de réceptivité maximale du stigmate ont été enregistrés juste après l'anthèse. A l'émission pollinique, le taux de viabilité pollinique est maximum (95 %). Le taux de germination maximum des grains de pollen est de 80 % dans un milieu gélosé sucré après 6 heures d'incubation. La pollinisation est entomophile, assurée essentiellement par des abeilles. Les taux de nouaison en pollinisation manuelle sont de l'ordre de 93 %. L'existence de fruits sans graines n'est pas liée au phénomène de parthénocarpie dans le vrai sens du terme.

Au terme de cette étude, quelques grands axes de recherche qui doivent soutenir les travaux d'amélioration sont dégagés: Etude du déterminisme du sexe, choix des critères de sélection et étude de leur hérabilité, puis sélection massale, ou hybridations suivies de clonages, selon le degré d'hérabilité des caractères à améliorer et selon leurs aptitudes à la combinaison. Pour les caractères dont l'amélioration nécessite des hybridations, la méthode de Sélection Réciproque est proposée.

Notes: This dissertation includes 35 pages of photos of the plant's botanical characteristics. This is microfiche number TDM 114 F3 ORSTOM, Paris.

Kengue, J. 1995. Le Safoutier (*Dacryodes edulis* (G. Don) H.J. Lam). *Le Flamboyant*. 33: 4-7.

Keywords: Canarium/Dacryodes/Zaire/Safoutier/Dacryodes edulis/Nigeria

Abstract: *Dacryodes edulis* is a species of the dominant stage in the natural dense forest of West and Central Africa from Nigeria to Zaire, a Burseracea, that produces a fruit widely eaten by the local people. *Dacryodes buetteri* (Ozingo), *Dacryodes igaganga* (Igaganga), *Dacryodes pubescens* (Safoukala), *Dacryodes narmandii* (Ossabel), and *Canarium schweinfurthii* (Aiélé) are discussed.

Notes: This article provides a short description of *Dacryodes* spp. including its uses and multiplication.

King, S.R.; Meza, E.N.; Carlson, T.J S.; Chinnock, J.A.; Moran, K; and Borges, J.R. 1999. Issues in the Commercialization of Medicinal Plants. *HerbalGram*. (47):46-51.

Keywords: commercialization/medicinal/medicinal plants/pharmaceutical/Prunus/*Prunus africana*/medicine

Notes: This magazine article discusses the case of medicinal plants being developed into profitable products by pharmaceutical companies with only limited benefits going to local people. One of the cases discussed is *Prunus africana*. An attached note: "Adapted from a book, *From Plants in the South to Medicines in the North: Perspectives on Bioprospecting*. To be published by the Center for Environment, University of Oslo: In press"

Koppert, G.J.A.; Dounais, E.; Froment, A.; and Pasquet, P. 1993. Food Consumption in Three Forest Populations of the Southern Coastal Area of Cameroon: Yassa - Mvae - Bakola. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; and Hadley, M., eds. *Man and the Biosphere Series*. Paris: UNESCO. 13: 1-16.

Keywords: Cameroon/food/nutrition/production

Abstract: Excerpted from the Introduction: "The aim of these studies was to compare the differences between three populations with different origins, living in the same ecosystem and having chosen contrasting production strategies. Within this international and multidisciplinary project, studies have incorporated nutritional and metabolic aspects (food consumption, seasonal variation in diet and energy expenditure, nutritional status), health aspects (clinical and serological data ethnographic issues (ethnobiology, cultural preferences and perceptions of nutritional value) and ecological considerations (land use, influence on lifestyle)."

Korup Ethnobotany Survey. 1989. 108 p.

Keywords: agriculture/Cameroon/ethnobotany/food/medicinal/medicinal plants

Notes: This report is a comprehensive examination of plant use around Korup. Along with sections on medicinal and wild food plants, there is a discussion of agriculture. In addition to the body of the report, appendix 1 is a 35-page summary of the information on medicinal plants organized by ailment and appendix 2 is an 85-page record of plant names and uses. Publication date is estimated.

Laird, S. A. 1993. The Natural Management of Tropical Forests for Timber and Non-Timber Products. MSc, Oxford Forestry Institute. 71 p.

Keywords: collection/forest management/growth/impacts/production/regeneration/trade

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Abstract: "Timber production can have a number of effects on the production of nontimber forest products. Destructive harvesting operations can cause direct damage to species in residual stands and those that make up the understorey and ground cover of forests, many of which are important NTFP's. Subsequent silvicultural treatments can reduce

species' diversity by promoting an increased proportion of commercial species and removing the competing "undesirables," many of which are important NTFP's. In some cases, timber species will have important nontimber uses locally, and the overharvesting of these species for timber will reduce collection of these species for their nontimber uses. The harvest of NTFP's could, at times, reduce the number and regeneration success of timber species as well. For example, if bark is stripped, reproductive propagules over-harvested, or exudates tapped heavily, growth rates and reproduction of timber species can be impaired and survival threatened.

"By reducing the structural and species diversity of a forest, timber harvesting, and silvicultural treatments can also produce a number of still largely unknown ecological repercussions. These result in reductions in numbers of pollinators, seed dispersers, and alterations in plant-herbivore relationships and may ultimately produce conditions in which it is difficult for many forest species to regenerate. A wide range of NTFP's are usually harvested from a given forest, so that reductions in species' diversity can directly impact the collection of these products, and the consumption and trade patterns of local people dependent upon them for their livelihood and survival.

"Timber and nontimber products can be incorporated into multi-purpose systems of natural forest management that both minimize the negative impacts of timber extraction and capitalize on the many benefits provided by a range of forest products."

Notes: This document contains over 15 pages of references.

Laird, S. A. 1999. The Management of Forest for Timber and Non-Wood Forest Products in Central Africa. In: *Non-Wood Forest Products of Central Africa: Current Research Issues and Prospects for Conservation and Development*. Sunderland, T. and Vantomme, P., eds. Rome: FAO. 12 p.

Keywords: Aframomum/Baillonella toxisperma/Cameroon/Cameroun/Canarium/demand/Equatorial Guinea/exploitation/food/forest management/Garcinia/Gnetum/growth/impacts/Irvingia/Limbe/logging/market/markets/medicinal/medicine/overexploitation/Pausinystalia/Pausinystalia/johimbe/pharmaceutical/phytomedical/Poga/Poga oleosa/production/Prunus/Prunus africana/Ricinodendron/storage/Tetrapleural toxisperma/yield/website/research/conservation

Web/URL's: <http://carpe.gecp.virginia.edu/products/products2a.asp>

Abstract: Excerpted from the Introduction: “This paper will briefly address some of the components of the timber-NWFP relationship in Central Africa, including:

- Species that yield both NWFP’s and timber;
- The impacts of logging operations on NWFP’s; and,
- The incorporation of the NWFP-timber relationship into management plans for sustainable forest management.”

Notes: This can be downloaded in pdf format from the website indicated by clicking on “Ecological Issues - Part 1.”

Laird, S.A. 1995. Fair Deals in the Search for New Natural Products. Gland, Switzerland: WWF-(World Wide Fund For Nature).

Keywords: search/research/traditional use/medicine/collection/conse-
vation/data base/commercialization

Web/URL’s: <http://www.rbgekew.org.uk/peopleplants/dp/dp1.htm>

Abstract: “Biodiversity prospecting is the exploration of biodiversity for genetic and biochemical resources of commercial value. Typically, samples of organisms are collected in countries that are rich in biodiversity, but financially poor, and dispatched for evaluation to laboratories in industrialized countries. Local knowledge may be used to guide this research, for example, by regarding traditional uses of plants as medicines.

“Following the Convention on Biological Diversity (CBD), biodiversity prospecting should be carried out in ways that promote the capacities within source countries to conserve biodiversity, through sustainable utilization or the development of relevant technical abilities.

“Biodiversity prospecting is an extractive use of natural resources and, as such, has some unusual features: the quantities of material collected are generally very small (at least initially), and the chance of a new commercial product arising from any particular sample is very low, although benefits can be huge if this happens. Benefits to source countries can accrue not only when a new commercial product emerges—which is likely to be many years after collection of the initial sample—but also during the phases of initial collection, screening, and product development.

“From the conservation perspective, the most significant categories of potential beneficiaries within source countries are local communities and national institutions concerned with the conservation of biodiversity and related development. Biodiversity prospecting should take place within a framework of agreements and regulations that are already in existence at the time when initial samples are collected.

“This paper describes how WWF can help promote such agreements and regulations at project, national, and international levels. Principal conclusions for the project level are:

1. WWF can play a valuable role to ensure that biodiversity prospecting results in benefits to conservation and development. WWF should not itself be a party to agreements concerning the collection of samples for biodiversity prospecting.
2. Agreements should be between the collectors of the samples (or their sponsoring organizations) and those who are the ‘gatekeepers’ to biodiversity (for example, local communities, government agencies). WWF should avoid being a party to agreements because of the potential criticism that WWF is exploiting biodiversity for its own benefit. Suitable roles for the WWF are as advisor, facilitator, or monitor.
3. There should be agreements which specify benefits for conservation and development for all types of research—carried out on WWF field projects.
4. Agreements should be required even if the research seems to be of a totally uncommercial nature. The boundaries between academic and commercial research are by no means always clear-cut. The manner in which research is conducted within a conserved area creates a framework of control over resource use (by community, project, or government) which is often carried over into commercial agreements, if these develop.
5. Ethnobiological knowledge.
Special care must be taken over the collection of ethnobiological knowledge, for example, regarding the uses of plants medicinally. Once such knowledge is released into the public domain (as through publications and databases), communities lose forever any prospects of control over its commercialization.

“Background information on the following subjects is available, upon request, from WWF International to WWF National Organizations and Country Offices:

- Research agreements (with examples).
- Commercial agreements (with examples).
- Sustainable sourcing of biological materials.

“Attention is also drawn to the WWF International publication *Ethics, Ethnobiological Research, and Biodiversity* by Dr. A.B. Cunningham (April 1993; reprinted as *Ethics, Biodiversity, and Natural Products Development*, September 1996), which describes the processes involved in biodiversity prospecting and gives guidelines for both national regulations and the behavior expected of collectors and their sponsoring organizations.”

Laird, S.A. and Lisinge, E. 1998. Benefit-Sharing Case Studies: *Ancistrocladus korupensis* and *Prunus africana*. A United Nations Environment Program (UNEP) Contribution; Fourth Meeting of the Conference of the Parties to the Convention on Biological Diversity; 1998 May; in Response to Decisions of the Third Meeting of the COP Calling for Benefit-Sharing Case Studies. UNEP. 46 p.

Keywords: *Ancistrocladus korupensis*/benefit sharing/Cameroon/pharmaceutical/phytomedical/*Prunus africana*

Notes: This report provides well-developed case studies of issues surrounding *Prunus africana* and *Ancistrocladus korupensis* development. The two are compared in a section entitled: “The *Ancistrocladus korupensis* and *Prunus africana* Case Studies from Cameroon: Contrasting Benefit-Sharing in the Pharmaceutical and Phytomedicine Industries.”

Laird, S.A.; Cunningham, A.B.; and Lisinge, E. 1998. (In press). One in Ten Thousand? The Cameroon Case of *Ancistrocladus korupensis*. In: *People, Plants, and Justice: Case Studies of Resource Extraction in Tropical Countries*. Zerner, C., ed. New York: Columbia Press. 41 p.

Keywords: *Ancistrocladus korupensis*/benefit sharing/Cameroon/conservation/economic/historical/medicinal/pharmaceutical/policy/research

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Abstract: The following is an excerpt from the Introduction: “We close the chapter with a few thoughts on benefit sharing which acknowledge the complexities and at times serious flaws in the logic of ‘access and benefit sharing’, but also reflect the authors’ belief that it is time to move forward in the development of a new paradigm for research and

commercial practices associated with biodiversity, including the development of ABS [access and benefit-sharing] measures. In particular, we discuss in relation to the case of *Ancistrocladus korupensis* the problems of benefit sharing when a species does not exist within ethnic or geographic boundaries, the importance of 'process' benefits resulting from the R&D process (michellamine B looked like a very likely candidate for drug-development, but for the time being is stalled by toxicity), and the need for research agreements and national legislation to set the stage upon which biodiversity prospecting relationships will be played out."

Leakey, R. R. B. and T. P. Tomich. 1997. (In press). Domestication of Tropical Trees: From Biology to Economics and Policy In: *Agroforestry in Sustainable Ecosystems*. Buck, L.E.; Lassoie, J.P.; and Fernandes, E.C.M., eds. New York: CRC Press/Lewis Publishers. 32 p.

Keywords: agriculture/Cameroon/commercialization/domestication/economic/food/food security/income-generating/policy/production/research/yield

Abstract: "About 0.5 percent of higher plants have been domesticated for agriculture and forestry and 6.0 percent as garden ornamentals. Within agroforestry, the further domestication and commercialization of trees for timber and nontimber forest products is recommended as a means of reducing the farmers reliance on subsistence food production, promote food and nutritional security, alleviate poverty, and enhance environmental resilience. Examples are given of the income-generating potential of tree products and how they are being developed commercially for small-scale production."

Leakey, R.R.B. 1987. Clonal Forestry in the Tropics—A Review of Developments, Strategies, and Opportunities. *Commonwealth Forestry Review*. 66(1): 61-75.

Keywords: Congo/Ivory Coast/Nigeria/Terminalia/tree improvement/Triplochiton

Abstract: ENGLISH: "Considerable progress has been made over the past decade in the development of clonal approaches to tropical tree improvement and forestry, both for pulp and timber. This review presents the current situation with *Eucalyptus* species and hybrids in the People's Republic of Congo and in Brazil, *Gmelina arborea* in Sabah, and *Triplochiton scleroxylon* and *Terminalia superba* in Nigeria, the Ivory Coast and Congo.

“The fears of some foresters and environmentalists are discussed and strategies are presented that should minimize the risks of disasters arising from the use of too few clones. It is suggested that the opportunities presented by clonal forestry should be considered for a range of other tree species in both the humid and dry tropics, including trees used in agroforestry.”

FRENCH: Pendant la décade qui vient de s'écouler, des progrès considérables ont été faits dans le développement des méthodes clonales d'amélioration des arbres tropicaux et de sylviculture, et pour la pâte et pour le bois. Cette revue présente la situation actuelle avec les essences et les hybrides d'*Eucalyptus* en République Populaire du Congo et en Brésil, *Gmelina arborea* en Sabah, et *Triplochiton scleroxylon* et *Terminalia superba* en Nigeria, au Cote d'Ivoire et au Congo.

Les soucis de quelques forestiers et environnementalistes sont discutés et de stratégies qui doivent réduire au minimum les risques de désastres qui peuvent résulter de l'utilisation de trop peu de clones sont présentées. On suggère que les possibilités présentées par la sylviculture clonale doivent être considéré pour une gamme d'autres essences d'arbres et dans les tropiques secs et dans les tropiques humides, y compris des arbres utilisés en agrisilviculture.

Leakey, R.R.B. 1998. (In press). Potential for Novel Food Products from Agroforestry Trees. *Food Chemistry*

Keywords: Cameroon/commercialization/Dacryodes/demand/domestication/food/Garcinia/Irvingia/kernel/market/production/Ricinodendron
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Abstract: “The domestication of trees for agroforestry approaches to poverty alleviation and environmental rehabilitation in the tropics depends on the expansion of the market demand for their nontimber forest products. This paper reviews published data on the nutritive values of the flesh, kernels, and seed oils of the 17 fruit tree species that have been identified, in four ecoregions of the tropics, by subsistence farmers as their top priorities for domestication.

“In some species, genetic variation in nutritional value has been reported; but in most species there is still inadequate information on which to base programs for the genetic improvement of these species. Farmers

and agroforesters have identified many of the biological constraints relevant to their viewpoint on production, but there is a need for inputs from the food industry into the identification of the desirable traits and characteristics of potentially novel food products. This paper calls for greater collaboration between agroforesters and the food industry to promote the domestication and commercialization of underutilized tree products.”

Notes: The ecoregions discussed in this paper are humid and dry west Africa, Amazonia, and southern Africa. There are sections dedicated to *Irvingia*, *Dacryodes*, *Ricinodendron*, and *Garcinia* including some examples from Cameroon. Publication date is estimated. Paper submitted to “Food Chemistry.”

Leakey, R.R.B. 1999. (In press). Agroforestry for Biodiversity in Farming Systems In: *The Importance of Biodiversity in Agroecosystems*. Collins, W. and Qualset, C., eds. New York: Lewis Publishers. 17 p.

Keywords: sustainability/profitability/domestication/production

Abstract: “Agroforestry can be used to diversify and intensify farming systems through the integration of indigenous trees producing marketable timber and nontimber forest products and is described in terms of an agroecological succession in which climax agroforests are biodiverse, highly productive, and profitable. The role of biodiversity in agroecosystem function is one of the keystones of sustainability.

“Complex agroforests that combine profitability with biodiversity are presented as a model worthy of expansion. Little is known ecologically, however, about how best to integrate agroforestry into the landscape or to what extent agroforestry can be used to link forest patches and expand biogeographical islands.

“Tree domestication is one way to diversify and intensify agroforestry systems and to make them profitable. A wise domestication strategy for indigenous trees will involve the capture and maximization of intraspecific genetic diversity thus benefiting both production and the environment.”

Leakey, R.R.B. 1999. (Submitted). Potential for Novel Food Products from Agroforestry Trees. *Food Chemistry*.

Keywords: commercialization/*Dacryodes*/*Dacryodes edulis*/demand/domestication/food/*Garcinia*/*Irvingia*/*Irvingia gabonensis*/kernel/market/

production/*Ricinodendron*

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Abstract: “The domestication of trees for agroforestry approaches to poverty alleviation and environmental rehabilitation in the tropics depends on the expansion of the market demand for their nontimber forest products. This paper reviews published data on the nutritive values of the flesh, kernels, and seed oils of the 17 fruit tree species that have been identified in four ecoregions of the tropics by subsistence farmers as their top priority for domestication.

“In some species, genetic variation in nutritional value has been reported; but in most species there is still inadequate information on which to base programs for the genetic improvement of these species. Farmers and agroforesters have identified many of the biological constraints relevant to their viewpoint on production, but there is a need for input from the food industry into the identification of the desirable traits and characteristics of potentially novel food products. This paper calls for greater collaboration between agroforesters and the food industry to promote the domestication and commercialization of underutilized tree products.”

Leakey, R.R.B. and Maghembe, J.A. 1995. Domestication of High Value Trees for Agroforestry: An Alternative to Slash and Burn Agriculture. ICRAF Position Paper 1. Nairobi: ICRAF. 12 p.

Keywords: agriculture/domestication/food/market/markets/Vegetative Propagation/slash and burn/deforestation/propagation

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Abstract: “This paper argues that to mitigate against food insecurity, deforestation, and land depletion, it is necessary to domesticate a range of traditionally important indigenous trees identified by farmers in the major ecoregions of the world. This can be done rapidly using the recently modified, traditional horticultural techniques of vegetative propagation and clonal selection, according to a strategy that aims to maximize productivity while minimizing risk, and incorporating the domesticates into one of a number of agroforestry systems. Examples of indigenous and undomesticated trees producing a range of high-value products with known or potential local, regional or international markets, are listed.”

Notes: A general report that lists some species from Central Africa.

Leakey, R.R.B. and Tomich, T.P. 1999. Domestication of Tropical Trees: from Biology to Economics and Policy (in press). In: *Agroforestry in Sustainable Ecosystems*. Buck, L.E.; Lassoie, J.P.; and Fernandes, E.C.M., eds. New York: CRC Press; Lewis Publishers. 32 p.

Keywords: agriculture/Cameroon/commercialization/domestication/economic/food/food security/income-generating/policy/production/research/yield

Abstract: "About 0.5 percent of higher plants have been domesticated for agriculture and forestry and 6.0 percent as garden ornamentals. Within agroforestry, the further domestication and commercialization of trees for timber and nontimber forest products is recommended as a means to reduce farmers' reliance on subsistence food production, promote food and nutritional security, alleviate poverty, and enhance environmental resilience. Examples are given of the income-generating potential of tree products and how they are being developed commercially for small-scale production.

"In agriculture, the domestication of the staple food crops was boosted by the Green Revolution which promoted food security and poverty alleviation, but now there is an opportunity to follow this with a Woody Plant Revolution for the "Cinderella" species overlooked, so far, by science and industry. This should be targeted at the diversification of agriculture, environmental rehabilitation, and the generation of cash by resource-poor farmers. This approach, which started in the 1970's, has recently gathered momentum. This paper presents progress, to date, within ICRAF; a review of the expected gains in product yield and quality through domestication; the biological possibilities; and the priorities and pitfalls needed to be considered in moving this approach forward.

"In conclusion, a number of important environmental, socio-economic, and policy questions associated with the domestication of tropical trees are raised as examples of topics for research."

Notes: The authors use examples from Cameroon.

Leakey, R.R.B., Last, F.T.; and Longman, K.A. 1982. Domestication of Tropical Trees: An Approach Securing Future Productivity and Diversity in Managed Ecosystems. *Commonwealth Forestry Review*. 61(1): 33-42.

Keywords: conservation/cuttings/domestication/food/propagation/storage/Vegetative Propagation/yield/Triplochiton

Abstract: "In recent years, progress has been made with domestication of *Triplochiton scleroxylon*, an important timber tree of the moist west African forests. Seed viability has been extended from a few weeks to many months by appropriate drying and cold storage. Seed supply is irregular, but the successful development of vegetative propagation methods has provided an alternative, regular supply of planting stock.

"Rooted cuttings have the further advantage that they can readily be tested to identify promising clones of good form. To this end, experiments on the physiology of branching have allowed the development of a screening technique that can predict later branching habit from tests on small plants. The occurrence of precocious flowering in glasshouse conditions has allowed progress towards control over reproduction and cross-pollination with deep frozen pollen have produced viable seeds from clones only 2—5 years old.

"The possibility of similarly domesticating many other tree species is discussed in relation to the need for improved selections for use in diverse managed ecosystems. Obtaining sustained yields of food and wood products on land formerly under moist tropical forest clearly depends on learning how to combine increased output from currently underutilized species with soil improvement and *ex situ* conservation."

Lham, S.A. 1993. Utilization of Forest Resources and Local Variation of Wildlife Populations in Northeastern Gabon. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; and Hadley, M., eds. *Man and the Biosphere Series*. Paris: UNESCO. 13: 1-14 .

Keywords: economic/food/Gabon/hunters/hunting

Abstract: Excerpted from the Introduction: "This chapter briefly examines the economic dependence of village inhabitants on bush meat sales in northeastern Gabon, the game species which are most important for hunters and trappers, and the variations in these species' populations in hunted and less disturbed areas. The animal survey data presented are

the results of a preliminary analysis oriented towards a comparison of the relative numbers of species in localities of different hunting pressure and of species' presence in various habitat types."

Makita-Madzou, J. and Profizi, J.P. 1996. Cueillette et Ramassage des Produits Végétaux Forestiers par les Téké-Tsaaya en Forêts Denses Humides du Massif du Chaillu (Congo). In: *Bien Manger et Bien Vivre: Anthropologie alimentaire et développement en Afrique intertropical: du biologique au social*. Froment, A.; De Garine, I.; Ch. B. Bikoi; and Loung, J.F., eds. ORSTOM. 12 p.

Keywords: alimentaires/Congo/cuillis/food/gather/Proto-agricultural/protoculture/ramassés

Abstract: FRENCH: Chez les Téké-Tsaaya du Congo, seule population de l'ethnie Téké vivant en forêt, beaucoup de produits alimentaires sont cuillis et ramassés dans les formations végétales naturelles. Nous montrerons la grande variété d'espèces spontanées participant à la diète journalière de ces populations forestières. Des techniques de protoculture peuvent être observées concernant quelques espèces importantes pour l'alimentation. Ces techniques sont décrites et les potentialités de quelques espèces sont soulignées.

ENGLISH: "The Téké-Tsaaya of Congo, the only population of the Téké ethnic group who live in the forest, collect and gather most of their foodstuff from plants that grow naturally. We will show an important variety of naturally available species that are contained in the daily diet of these forest populations. Proto-agricultural techniques can be observed concerning some species that can be vital as food. These techniques are described and the potentialities of certain species highlighted."

Notes: This is a French-English document.

Mallet, P. 1999. Analysis of Criteria Addressed by Forestry, Agriculture and Fairtrade Certification Systems. NTFP Certification and Marketing Program, Falls Brook Centre. Canada, Falls Brook Centre. 17 p.

Keywords: agriculture/certification/marketing

Notes: This is a report on the compatibility and areas of overlap between existing certification criteria as they relate to NTFP's. The scope is limited to the analysis of criteria from the "standards documents." The analysis categories are: institutional, ecological, and socio-economic

with subsets under some categories. Twenty-seven “criteria sets” from many different organizations were analyzed. Included is a matrix of standards and criteria sets.

Measuring Diversity: Methods of Assessing Biological Resources and Local Knowledge. In: **People and Plants Handbook: Sources for Applying Ethnobotany to Conservation and Community Development Series.** Martin, G. J.; Hoare, A. L.; and Agama, A. L., eds. 1998. Paris: UNESCO. 4: 1-40.

Keywords: community development/conservation/ethnobotany/website

Web/URL's: <http://www.rbgekew.org.uk/peopleplants/handbook/handbook4/index.html>

Notes: While global in scope, this document contains abundant references. It is available on the indicated website. Back issues in this series are out of print but are becoming available online.

Medicinal Plants. Howe, S., ed. 1996. **Limbe, Cameroon: Mount Cameroon Project.** 80 p.

Keywords: conservation/Limbe/market/markets/medicinal/pharmaceutical/medicinal plants

Notes: This book is designed for visitors to the Limbe Botanic Garden. It provides short usable descriptions and drawings of 30 medicinal plants. Descriptions include habitat and distribution, conservation status, markets, medicinal uses, and pharmaceutical uses. Publication date is estimated.

Merriam, R. and Guercio, A.A. 1993. Development and Management of Conservation Education and Sustainable Alternative Economic Activities in Protected Areas. Brattleboro, VT: Micro Development Corps for the Government of Congo Wildlands Protection and Management Project. (Global Environmental Facility, Final Report. 78 p.

Keywords: bibliography/Congo/conservation/economic/ecotourism/small enterprise/small business/business

Notes: This report is based on two trips to establish protected area management of the Dimonika and Conkouati Reserves. As such, it details findings and recommendations on small business, NTFP use, artisanal crafts, and ecotourism development. Included are appendices with a listing of plant specimens collected, a bibliography, and

ecotourism-related information. Micro Development Corps no longer exists.

Mialoundama, F. 1993. Nutritional and Socio-Economic Value of *Gnetum* Leaves in Central African Forest. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O F.; Pagezy, H.; Semple, A.; M. Hadley, A., eds. *Man and the Biosphere Series*. Paris: UNESCO. 13: 6.

Keywords: food/*Gnetum*/market/markets/nutrition/women

Abstract: Excerpted from the Introduction: “*Gnetum* holds an important place in the diets of many people in Central Africa, and the nutritional value of its leaves, a significant source of protein, essential amino acids and mineral elements, is presented below. The development of such valuable spontaneous food resources can be an effective way of fighting malnutrition. A series of studies of the physiology and biology of *Gnetum* has been undertaken (Mialoundama, 1979; Mialoundama and Paulet, 1985, 1986) with the aim of learning how it can be cultivated. The role played by women in the process of supplying the leaves, from gathering them in the forest to selling them in the markets, is paramount, as is shown in this contribution.”

Mogba, Z. 1999. Etude des Systèmes Locaux de Gestion des Ressources Forestières à Djoum République du Cameroun. Washington, DC: Innovative Resources Management. 42 p.

Keywords: forest management/agricole/conservation/élites

Notes: This report provides an anthropological/sociological perspective on forest management by local people. A sampling of topics from the table of contents includes: Les principes de territoire et de territorialité; Analyse des institutions sociales traditionnelles; Les régimes de propriété; Les droits et modes locaux d'accès, d'usage et de contrôle des ressources; L'accès aux terres agricoles; L'usage des jachères; Les ressources fauniques terrestres; Les produits de cueillette et ramassage; Les arbres utiles; L'hégémonie étatique sur les ressources forestières; L'économie forestière; Le développement du braconnage; La primauté de la législation forestière; La synergie entre les institutions sociales traditionnelles et les élites internes et les ONGs de l'environnement; La capacité du système social dans la gestion locale des ressources forestières; et La médiation comme mode de résolution des conflits entre acteurs locaux autour des ressources forestières.

Morakinyo, A.B. 1995. Profile and Pan-African Distributions of the Rattan Species (Calamoideae) Recorded in Nigeria. *Principes*. 39(4): 197-209.

Keywords: ecology/rattan/Nigeria

Notes: The author describes African rattans as an economically important but threatened resource that is poorly known. This article briefly describes the distribution and ecology of nine species. Recommendations include carrying out a pan-African taxonomic study, more rattan collecting, and establishing a rattan arboretum.

Nair, P.K.R. and Merry, F. 1996. Development of Non-timber Forest Products: Lessons from Agroforestry. Gainesville, FL, USA: University of Gainesville. 23 p.

Keywords: exploitation/income/market/policy/research/rural/sustainable harvest/growth/agroforestry practice

Abstract: "Nontimber forest products (NTFP's) are now receiving increasing attention as a source for increasing rural income, especially in developing countries. The current level of interest in NTFP development is somewhat similar to what it has been when organized efforts in agroforestry started about two decades ago. Given the parallels between agroforestry practices and NTFP exploitation, it is prudent to make use of the knowledge and experience gained in agroforestry development while deciding the development issues and strategies for NTFP development. Based on an analysis of the similarities between agroforestry and NTFP development issues, the paper recommends the following broad priority areas of attention for NTFP development: development of a systematic classification scheme, strengthening policy and institutional support, applied ecological research on growth and reproduction of NTFP producing trees, and strict attention to market management to encourage long-term, sustainable harvest."

Notes: Publication date is estimated.

Natural Resource Perspectives Papers website. Hosted by Overseas Development Institute, London.

Web/URL's: <http://www.oneworld.org/odi/nrp/index.html>

Contact/Web Master: m.woodland@odi.org.uk

Keywords: policy/data base/website

Abstract: "Natural Resource Perspectives present accessible information on current development issues and are sent to a wide audience of policymakers, researchers, and people working in the nongovernmental

sector. Readers are encouraged to quote from or duplicate them, but as copyright holder, ODI requests due acknowledgement. The Editor welcomes manuscripts for this series.”

Notes: This searchable database provides links to numerous papers that can be downloaded in PDF format. There are also links to other portions of the website with information on additional publications.

Ndoye, O. 1994. The Potential Role of Markets in Forest Resources Degradation: An Example of Palm Wine in Central Africa. Paper presented at IFPRI, NRI, Center for International Forestry Research, ICRAF Workshop on Markets for Non-timber Tree Products, 1994. Annapolis, MD. 19 p.

Keywords: Cameroon/market/markets/palm wine/policy/preservation/profitability

Abstract: Excerpted from the Introduction: “The overall objective of this paper is to investigate the financial profitability of palm wine tapping in the Humid Forest Zone of Cameroon and to assess how the existence of markets for palm wine can be a threat to the overharvesting of the palm tree. The specific objectives are:

- a) to describe the different ways of tapping palm wine and the different categories of palm wine tappers in the Humid Forest Zone of Cameroon.
- b) to assess the financial profitability of palm wine tapping and the returns to labor devoted to palm wine tapping.
- c) to discuss the implications of palm wine tapping.

“This paper argues that palm wine tapping is more lucrative for farmers who preserve the palm trees than farmers who do not. As a result, policies aimed at preventing the overharvesting of palm trees need to be introduced as a means for forest preservation.”

Notes: This version of the paper contains a revision to the “Implications” section dated December 12, 1994.

Ndoye, O. 1995. Commercialization and Diversification Opportunities for Farmers in the Humid Forest Zone of Cameroon: The Case Study of Non-Timber Forest Products. Yaoundé, CIFOR. 42 p.

Keywords: Cameroon/commercialization/economic/employment/enterprises/food/food security/income/*Irvingia*/market/palm nut/palm wine/policy/preservation/profitability/rattan/rural/sustainability/tenure

Abstract: Excerpted from the Introduction: “The overall objective of this paper is to show the importance of NTFP’s in the Humid Forest Zone of Cameroon and to discuss the implications of NTFP for sustainable land use and forest preservation.

“The specific objectives are a) to discuss commercialization opportunities of NTFP’s and their contribution to food security and income diversification, b) to study the economics of major NTFP activities, c) to discuss the returns to labor for major NTFP activities, and d) to discuss the implications for sustainable land use and forest preservation.

“This paper argues the following a) palm wine tapping is more profitable for farmers who preserve the palm trees than farmers who do not. As a result, policies aimed at preventing the overharvesting of palm trees need to be introduced as a means for forest preservation; b) rural small scale enterprises related to NTFP’s are financially profitable and are a source of employment for resource-poor farmers, and that the profitability can even increase further with technological innovation; c) NTFP’s need to be integrated in the cropping system of the Humid Forest Zone. But this will not be successful if farmers do not have tenure security; and d) Security of tenure stimulate farmers to make long-term investment in the land and in NTFP’s thereby increasing the sustainability of land use. This will improve the functioning of the credit market because land will be used as collateral.

“The second section of this paper gives an overview of the different concepts used. The third section discusses the commercialization opportunities of NTFP’s and their contribution to food security, income diversification and health protection. Section 4 studies the economics of major NTFP activities. Section 5 draws the overall implications of the study.”

Notes: The paper provides a well researched examination of four NTFP’s. Most extensively discussed is palm wine.

Ndoye, O. 1995. The Markets for Non-Timber Forest Products in the Humid Forest Zone of Cameroon and its Borders: Structure, Conduct, Performance and Policy Implications. Draft. Yaoundé: CIFOR. 87 p.

Keywords: Cameroon/conservation/forest management/market/marketing/markets/policy/research/rural/urban/women/business/profit

Abstract: Excerpted from the Introduction: “The overall objective of

this study is to investigate the performance of NTFP markets in the Humid Forest Zone of Cameroon and its borders and to draw implications for both market research and policies that will lead to expanded market opportunities for resource-poor farmers and better forest management and conservation.

“The specific objectives of the study are:

1. To estimate the quantity of NTFP marketed.
2. To estimate marketing costs and margins of market intermediaries.
3. To describe the different marketing channels through which NTFP flow from the farmer to the final consumer.
4. To identify the major constraints in markets for NTFP.
5. To identify the policies and actions needed to improve the performance of markets for NTFP.

“The more specific research questions addressed in the study are:

1. What are the marketing channels through which NTFP flow from farmers to urban consumers?
2. What are the quantities of NTFP marketed in the Humid Forest Zone of Cameroon and in neighboring countries?
3. What are the major constraints faced by market participants in the assembly and distribution of NTFP, and what should be done to overcome these constraints?
4. What are the major constraints faced by transporters, and what impact do these constraints have on transport costs paid by market participants?
5. Are there innovative procedures developed by market participants to reduce transaction costs, or to improve their business practices?
6. Are prices in the marketing system providing market participants with signals that stimulate transfers of NTFP from rural to urban areas?
7. Are there excess profits in the marketing system? or Are farmers being exploited by market intermediaries?
8. What policies and actions are needed to improve the performance of markets for NTFP?”

Ndoye, O.; Ruiz Pérez, M.; and Eyebe, A. 1997. The Markets of Non-Timber Forest Products in the Humid Forest Zone of Cameroon. Schreckenber, K. and Richards, M., eds. In: Rural Development Forestry Network Paper. London: ODI. 22c: 1-20.

Keywords: bibliography/Cameroon/Cola/Dacryodes/demand/employment/gatherers/income/*Irvingia*/market/marketing/markets/production/Ricinodendron/rural/rural development/website/women/household/urban/*Dacryodes edulis*

Web/URL's: <http://www.oneworld.org/odi/pubs98/rdfn.htm>; <http://www.oneworld.org/odi/fpeg/networkpapers22english.html>;

Abstract: "Many rural dwellers in tropical regions depend on nontimber forest products (NTFP's) for their livelihood and their income needs. Local markets play an important role in enabling forest-dependent households to realize a significant part of their cash income through sale of NTFP's. Increased urbanization (as a result of rural to urban migration) is a significant factor that expands the size of local NTFP markets. This paper focuses on local markets and on market intermediaries who facilitate the coordination (or the matching) of supply and demand of NTFP's by providing market outlets to farmers and guaranteeing a source of domestic supply of NTFP's for consumers. The paper presents the results of a study that analyzed the four main NTFP's sold in the humid forest zone of Cameroon (*Dacryodes edulis*, *Irvingia* spp., *Cola acuminata* and *Ricinodendron heudelotii*). The study found that the quantity of NTFP's marketed is significant, amounting to at least U.S.\$1.75 million in the first half of 1995. More than 1,100 traders, mainly women, are engaged in the distribution of NTFP's. Furthermore, the marketing margins obtained by traders vary between 16 percent (for *Dacryodes edulis*) and 30 percent (for *Irvingia* spp.) of the value of sales. Thus, the study confirms the role of NTFP's as a source of employment and income not only for gatherers but also for traders and suggests the need and potential for developing these markets."

Notes: This paper focuses on the "cash commodity-oriented production system" rather than the subsistence economy. It provides a good characterization of a relatively expansive marketplace. Includes a bibliography and can be ordered or downloaded from the websites indicated.

Ndoye, O.; Ruiz Pérez, M.; and Eyebe, A. 1998. NTFP Markets and Potential Forest Resource Degradation in Central Africa. The Role of Research for a Balance Between Welfare Improvement and Forest Conservation. Paper Presented at the International Expert Workshop on Non-Wood Forest Products (NWFP's) for Central Africa; Limbe Botanic Garden. Yaoundé: CIFOR. 19 p.

Keywords: Cameroon/CAR/Cola/conservation/Equatorial Guinea/Gabon/Garcinia/income/*Irvingia*/kernel/Limbe/market/marketing/markets/research/rural/Central African Republic/bush mango/fruits

Abstract: "This paper investigates the importance of income generated from marketing selected NTFP's in Central Africa. The focus is mainly on local markets in the humid forest zone (HFZ) of Cameroon and markets at the borders of Central African Republic (CAR), Equatorial Guinea, and Gabon.

"The main NTFP species considered in this paper are *Irvingia* spp. (bush mango nut), *Cola acuminata* (kola nut), *Garcinia lucida* (essock), and *Garcinia kola* (onie). Emphasis is placed on the marketing of the kernel and the fruit of *Irvingia* spp. and *Cola acuminata* while the marketing of the bark is considered for *Garcinia lucida* and *Garcinia kola*.

"The study found that the value of the above NTFP marketed amounted to US\$753,000 and US\$561,000 in the first half of the 1995 and 1996, respectively. Of these amounts, the value of barks marketed (both for *Garcinia lucida* and *Garcinia kola*) represented US\$30,000 and US\$24,000 in 1995 and 1996, respectively. The decline in importance of NTFP marketed as a result of lower quantity supplied shows the thinness of NTFP markets due to their dynamic and unpredictable nature, which changes the rule of markets in assembling and distributing NTFP's from one year to another.

This study also found weekly marketing margins from barks are comparable and may even be higher than those from kernels (*Irvingia* spp.) and fruits (*Cola acuminata*). The harvesting practices of barks are not always done in a sustainable manner yet their market provides revenues for both traders and rural dwellers. This trade-off shows the potential role of NTFP markets in forest resource degradation and underlines the difficult balance between improving the livelihood of forest dependant people and forest conservation.

“Future research should focus on determining the sustainable rate of bark harvest that would enable forest dwellers to continue to derive part of their livelihood from *Garcinia lucida* and *Garcinia kola* while preserving these trees.”

Notes: This paper was generated based on interviews of 24 to 27 percent of NTFP traders over 29 weeks in both 1995 and 1996. It provides a narrowly focused, indepth description of the markets for two important NTFP's.

Ndoye, O.; Ruiz Pérez, M.; Désiré, M.A.; and Ngono, D.L. 1998. Les Effets de la Crise Economique et la Devaluation sur l'Utilisation des Plantes Medicinales au Cameroun. Implications pour la Gestion Durable des Forêts. Papier Présenté à l'Atelier International FORAFRI (CIRAD-Forêt/CIFOR) sur la Gestion Durable des Forêts Denses Humides Africaines Aujourd'hui, Libreville, Gabon. Yaoundé: CIFOR.

Keywords: Cameroun/crise économique/crise économique/domestication/dévaluation/Gabon/plantes médicinales/production/dévaluation/rurale/économique

Abstract: Ce papier a pour objectif d'étudier les effets de la crise économique et la dévaluation sur l'utilisation des plantes médicinales dans la Zone Forestière Humide du Cameroun. Les principales conclusions du papier sont les suivantes:

- a. la crise économique et la dévaluation ont renchéri les prix des plantes médicinales, augmentant leur valeur pour les populations rurales ainsi que la pression sur ces ressources forestières.
- b. la dévaluation a renchéri les prix des produits pharmaceutiques et les soins de santé des populations rurales et a rendu les plantes médicinales et la médecine traditionnelle plus attrayantes.
- c. la préférence de la médecine moderne par rapport à la médecine traditionnelle est fonction de la stabilité (garantie) ou la permanence des revenus des ménages ruraux. Cela implique que pour réduire la pression sur les ressources forestières (à cause de l'utilisation des plantes médicinales) et favoriser la gestion durable des forêts, les pouvoirs publics doivent promouvoir des politiques de développement visant à augmenter et à maintenir les revenus des populations rurales.
- d. l'augmentation ou le maintien du pouvoir d'achat des populations rurales est une condition nécessaire pour leur permettre d'utiliser la médecine moderne, mais elle ne sera pas suffisante si les coûts de

la médecine moderne ne sont pas subventionnés pour les populations rurales et les populations urbaines les plus démunies.

- e. la domestication et l'incorporation des plantes médicinales dans les systèmes de production peuvent être des moyens de réduire la pression sur les ressources forestières utilisées dans la médecine traditionnelle.

Notes: Only the abstract was available for review.

Nef, R. 1997. Socio-Economic Impacts of Forest Exploitation on the Livelihoods of Local People in Southern Cameroon: Timber Versus Non-Timber Forest Products. The Netherlands: Department of Forestry, Wageningen Agricultural University. 36 p. Thesis

Keywords: bibliography/Cameroon/conflict/exploitation/impacts/logging/medicinal/medicine/production/quantitative/stumpage

Notes: The author used survey data to argue that logging has a mixed impact on the production of NTFP's for the local people. He reports that the greatest impact is with the Bakola people who are dependant on NTFP's for medicines with few substitutes. He suggests a compromise where loggers forego a portion of the marketable timber to safeguard NTFP production. The paper is quantitative in nature and includes tables, a bibliography, and appendices.

N'Goye, A. 1999. *Irvingia gabonensis* dans les systèmes agroforestiers: perception, motivation et attitude des populations dans le nord du Gabon. Paper presented at Séminaire FORAFRI de Libreville - Session 3 Produits de la Forêt, 1999, at Libreville, Gabon. 7 p.

Keywords: commerce/conservation/filière/Gabon/*Irvingia*/tenure/*Irvingia gabonensis*

Abstract: Le Manguier sauvage (*Irvingia gabonensis*) est traditionnellement associé à de nombreuses cultures au Gabon, plus particulièrement dans le nord, cadre de cette étude. Sa conservation dans les systèmes agraires est symptomatique d'une stratégie visant à diversifier les ressources des paysans, et à leur assurer un certain revenu. Le fruit du Manguier sauvage renferme en effet une amande qui rentre dans la composition de nombreux plats cuisinés, et qui fait donc l'objet d'un véritable commerce.

Cette étude détaille la place du Manguier sauvage dans les systèmes agraires du nord du Gabon (région d'Oyem): le type de culture auquel il

est associé, le mode d'appropriation de l'arbre et de ses produits en fonction de sa localisation (tenure), les modalités de gestion des peuplements à *Irvingia gabonensis*.

Certaines directions de recherche pourraient cependant être explorées, ayant trait notamment à la sélection d'individus et la multiplication végétation, à l'organisation sociale autour de l'exploitation du Manguier sauvage, et la connaissance globale de la filière.

Notes: Publication date is estimated

Ngwasiri, C.N.; Lambi, C.M.; Ngwasiri, D.N.; Young, J.N.; and Nyamnjoh, F.B. 1996. Indigenous Practices in the Mount Cameroon Region. Buea, Cameroon: The Cameroon Indigenous Knowledge Organization. 44 p.

Keywords: Cameroon

Notes: This report describes three villages in the study area. The study cuts across sectors by looking at cultural organizations, farming systems, effects of modernization, and others. NTFP use receives mention throughout the report. The publication date is estimated.

Njombe Ewusi, B. 1999. Sustainable and Participatory Management of *Prunus africana* on Mount Cameroon, an Endangered Tree Species: Community Participation in the Strive for Sustainability. Paper presented at Séminaire FORAFRI de Libreville - Session 3 Produits de la Forêt, 1999, at Libreville, Gabon. 8 p.

Keywords: Cameroon/inventory/market/medicinal/monitoring/overexploitation/*Prunus*/*Prunus africana*/sustainability/yield/participation

Abstract: "Bark of *Prunus africana*, an afro-montane tree species, has been exploited from Mount Cameroon for the past 20 years by Plantecam, a French owned medicinal plant exploiter, for the international market. *Prunus africana* is listed on CITES Appendix II because of the threat of overexploitation. Over the last 4 years, Mount Cameroon Project has conducted a detailed inventory of the resource and carried out yield studies to develop estimates of a sustainable quota. All stakeholders were closely involved in the identification and resolution of resource management problems. Community based resource management institutions are sustained by mechanisms that attempt to ensure fair and equitable distribution of benefits which contribute as much as possible to the livelihoods of the local community. The success or otherwise of the system is being tracked by a built-in participant monitoring and evaluation system."

Nkwatoh, A.F. and Weh, F. 1998. NTFP's Market Survey for Zone 3. Dry Season Report December 97 - Feb 98. Buea, Cameroon; Mount Cameroon Project. 39 p.

Keywords: agriculture/economic/eru/food/Gnetum/Guinée Equatoriale/income/*Irvingia*/market/market survey/marketing/production/rural/urban/yield/bush mango/mapping/*Irvingia gabonensis*

Abstract: "The survey is supposed to be executed in two seasons—the dry season and the wet season. This report is that of the dry season phase which was done in December and February, taking two weeks per month.

"Study Approach: The survey was carried out using appropriate Participatory Rural Appraisal tools, such as semistructured interviews, mapping, direct observations, and ranking.

"The objective was to study the source, production, and marketing of NTFP's in zone 3 of the MCP Buea area and make recommendations for further intervention in the zone.

The results show that

- i. A total of about 27 NTFP's were identified in the area. These are exploited by the local community for both commercial and subsistence purposes. From ranking using income as a criterion, five NTFP's were identified to be a main source of women's income while only supplementing men's income. These include Bush mango (*Irvingia gabonensis*), Njangsang (*Ricinodendron leudelotii*), Eru (*Gnetum africanum*), Bush pepper (*Piper guineensis*), and Bush meat.
- ii. Most of these NTFP's were sources from the following ecosystems in and around the zone: high forest, secondary forest, fallow, and farmlands. Products that came from the high forest came mainly from the Bomboko Forest Reserve, Southern Bakundu Forest Reserve, the Proposed Bakweri Protected Forest Reserve, and the Communal Forest that stretches above the zone up the mountain
- iii. Production processes were found to be still local and hence very little value is added in the production chain to the end product. This reduces the benefit margin that accrues from the product to the people.

"Marketing of NTFP's was found to be very competitive and fragmented with much more benefit going to the buyam sellams from urban areas

who are the major buyers of NTFP's and agricultural products in the zone. The people in this zone are predominantly farmers of both cash and food crops, such as cocoa, coffee, cocoyams, plantains. NTFP's are only collected to supplement income from agricultural products.

"The zone is made up of heterogeneous tribes coming from the north-west, southwest, western provinces and Nigerians. Though an indigenous Bakweri area, there are comparatively very few Bakweri indigenes present.

"Water and agriculture were found to have played a big role in settlements in the area. The high fertility of the soil attracted the large populations resident in the area today. Some of the villages are quite far from water sources. These, however, have lower populations. From all indications, forest edge people value the forest only for what they get out of it. Agriculture yields a huge annual income and this leads to further depletion of the forest. To reduce this pressure on the forest, NTFP economic activities having the standing forest as a land bank should be developed to yield an income close to that of agriculture."

Non Wood Forest Products. A Regional Expert Consultation for English-speaking African Countries. Arusha, Tanzania, October 17-22, 1993. Technical publication n° 21. London, Commonwealth Science Council.

Non-Timber Forest Products from the Tropical Forests of Africa: A Bibliography. van der Linde, H., ed. 1997. Netherlands Committee for the IUCN.

Keywords: bibliography/research/ecology/marketing/tourism/anthropology

Abstract: Excerpted from the Forward: "Although it is fully recognized that nontimber forest products are of importance in all types of forests, this particular bibliography has been restricted to the *tropical* forests of Africa. Included are the tropical lowland forests, swamp forests, montane forests and mangroves of West, Central and East Africa and Madagascar as described by Sayer *et al.* (1992).

"The definition of nontimber forest products which has been used for this bibliography is that used by de Beer & McDermott (1996): 'The term Nontimber forest products encompasses all biological materials other than timber which are extracted from natural forests for human

use.’ Hence, no literature on agroforestry and enrichment of forests has been included.

“As the subject of NTFP’s is related to many research disciplines, an effort has been made to collect information in the fields of ecology, (ethno)botany, pharmacology, anthropology, socio-economy and management, and references have been annotated where possible. The bibliography is divided into three parts: references relevant to 1) the African continent and supranational regions, 2) specific countries, and 3) to the subject in general. The third part was included because much information was found on subjects related to NTFP’s that are applicable worldwide (e.g., marketing and tourism). The growing interest in NTFP’s over the last decade has resulted in an increase of articles and reports; therefore, this present bibliography does not pretend to be complete and NC-IUCN welcomes any additions readers may wish to provide.”

Non-Wood Forest Products and Income Generation. *Unasylva* 50[3]. 1999. Rome.

Keywords: bibliography/enterprises/extension/income/policy/rural/trade

Web/URL’s: publications-sales@fao.org

Notes: This edition of *Unasylva* contains 10 articles on various aspects of NTFP’s. One is focused on Central Africa (Pérez et al, 1999) and is referenced separately in this bibliography. The remaining articles are either global in scope or they concentrate on a region other than Central Africa. However, the journal provides an up-to-date discussion of a number of relevant topics, including requisites for rural nonwood forest product enterprises, green trade, forest policies, income generation in Europe and the neotropics, and extension challenges.

Non-Wood Forest Products in the Central Africa Basin. 1995. Washington, DC: CARPE-USAID.

Keywords: agriculture/beekeeping/buffer zone/Cameroon/CAR/children/collection/Congo/conservation/Dacryodes/Democratic Republic of Congo/domestication/economic/exploitation/extension/food/forest management/fruits/Gabon/Gnetum/household/hunting/income/insects/inventory/*Irvingia*/Limbe/market/market survey/marketing/markets/medicinal/medicinal plants/*Pausinystalia*/*Pausinystalia johimbe*/policy/PRA/processing/production/profit/proposal/*Prunus*/*Prunus africana*/quantitative/rattan/research/rural/rural development/slash and burn/sustainability/tenure/trade/website/wild fruit/women

Web/URL's: <http://carpe.gecp.virginia.edu/part/nwfpmatr95.xls>

Notes: This is an annotated Excel 95 spreadsheet available on the CARPE website. It is a country by country listing of organizations and their NTFP-related activities. An Excel 97 version is also available.

Non-Wood Forest Products of Central Africa: Current Research Issues and Prospects for Conservation and Development. Sunderland, T. L. Clark, and Vantomme, P. Ed. 1999. Rome: FAO. 288 p.

Keywords: agriculture/*Baillonella toxisperma*/Cameroon/Cameroun/Canarium/Cola/community forest/conflict/Congo/conservation/Dacryodes/demand/domestication/economic/EquatorialGuinea/exploitation/food/forest management/fruits/Gabon/Garcinia/Gnetum/growth/honey/household/household income/impacts/income/inventory/Irvingia/*Laccosperma*/*Laccosperma secundiflorum*/Limbe/location/logging/market/marketing/markets/medicinal/medicine/monitoring/overexploitation/*Pausinystalia*/*Pausinystalia johimbe*/pharmaceutical/phytomedical/Poga/*Poga oleosa*/population structure/production/*Prunus*/*Prunus africana*/rattan/regeneration/research/*Ricinodendron*/storage/*Tetrapleura*/*toxisperma*/website/women/yield/propagation/fuelwood

Web/URL's: <http://carpe.gecp.virginia.edu/products/products2.asp>

Abstract: Excerpted from the Introduction and Workshop Summary: "Between 10 and 15 May 1998 the United States Forest Service held an International Expert Workshop on Nonwood Forest Products in Central Africa at the Limbe Botanic Garden in Cameroon, with support from the USAID Central African Regional Programme for the Environment (CARPE) and the Food and Agriculture Organization of the United Nations (FAO).

"The workshop brought together over 60 regional and international experts to:

- Share their experience and knowledge on the use and management of nonwood forest products;
- Provide a forum for applied scientists working in the region to meet new colleagues and develop informal networks;
- Help avoid duplication of effort by exposing participants to past and ongoing research and applied work on NWFP's in the region;
- Seek consensus on a prioritized set of short- to mid-term actions to promote the sustainable use of NWFPs within the Congo Basin for the benefit of local communities and the conservation of forest biodiversity.

“Ecological lessons learned

- Depending on the life history of the species involved and how the NWFP is harvested (whole plant, leaves, bark, fruits, resin, etc.) the impact of NWFP use on the population structure and long-term productivity of the resource may not be discernible in the short-term (van Dijk; Sunderland et al.; Cunningham). For example, the impact of seed harvesting on tree regeneration may not be detected for 60-100 years in long-living tree species (Peters).
- Some dense forest trees species in the Congo basin such as okoumé (*Aukoumea klaineana*) appear to regenerate only in relatively large disturbed areas (Laird).
- Variability in flowering and fruiting may result in wide fluctuations in NWFP availability from year to year (van Dijk).
- High diversity of tropical forests means that the density of NWFPs may be low or very patchy in distribution (Peters; van Dijk; Cunningham).
- Sustainable use requires a) inventories of standing stock, b) productivity estimates, c) monitoring of regeneration and d) assessment of present and future demand (Peters).
- Propagation and cultivation of many NWFPs are difficult or poorly understood (Okafor; Nkefor et al.; Tchoundjeu et al.).
- Reduced-impact harvesting is only likely if the harvester believes he or she will benefit from the effort (van Dijk; Cunningham).
- Results of ecological research have to be made available to local communities, other resource users and politicians if the full value of the forest is to be reflected in forest use decisions (Shanley).

“Socio-political lessons learned

- Harvesters of NWFPs often modify the landscape to facilitate regeneration. For example, rattan harvesters ensure adequate light penetration to encourage regrowth (Sunderland).
- Local communities are more likely to have in place and enforce NWFP-use restrictions if the community is ethnically homogenous and stable in composition (Malleon; Shanley).
- Absentee elites often attempt to capture the value of community forests for their personal gain, and may actively attempt to diminish the effectiveness of community-based sustainable NWFP use systems (Malleon).
- Resource users know what NWFPs are important to them, what NWFPs they would like to see domesticated, and what characteristics

of NWFPs they would like improved (Okafor; Nkefor et al.; Tchoundjeu; Ladipo).

- Raising household income can have perverse impacts on NWFP consumption (e.g. more income means higher demand for goods, and the ability to hire labor to intensify harvesting of NWFPs). Gabon is an example of a relatively wealthy nation that maintains a high per capita demand for NWFPs (Profizi; Yembi). There is also a high demand for NWFPs in Europe from prosperous African expatriates (Tabuna).
- Resource ownership is a key to individual investment in NWFPs. For example, women were keen to plant trees as sources of scarce fuelwood but men realized that trees might give women de facto ownership over “their” land (Burnley).
- The first step in any NWFP action is to determine what people use and its relative importance in the domestic and market economy (Ndoye et al.; Clark and Sunderland; Liengola; Yembi; Kimpouni; Sunderland and Obama).

“Market-economic lessons learned

- Developing effective methods for preserving and storing NWFPs is critical to maximizing the income that can be generated from each unit of a given NWFP (Ladipo; Tabuna).
- Without access to markets NWFPs contribute very little to household income, but may still contribute significantly to domestic consumption (van Dijk; Malleson).
- NWFP marketing is seldom a specialist activity, and is more often used to generate capital needed to start other economic activities such as tree-crop plantations, or to pay for seasonal (school fees) or unexpected costs (funerals, illness, etc.) (Sunderland; Defo).
- The legal framework for harvesting NWFPs is unclear and harvesters risk harassment while transporting their products to market (Sunderland et al.; Defo; Nkuinkeu).
- Recently urbanized populations and nationals living overseas can generate strong demand for NWFPs that are viewed as one of their few remaining links to a traditional village way of life (Tabuna).
- Small changes in the supply of NWFPs appear to result in large changes in the quantity marketed (i.e. markets for NWFPs are thin) resulting in supply uncertainty and irregular income from NWFP marketing (Liengola).
- Domestication and on-farm cultivation are the keys to ensuring reliable supplies of NWFPs (Okafor; Nkefor et al.; Tchoundjeu; Nkuinkeu; Sunderland).

- Logging revenues accrue at the national/treasury level, whereas NWFP revenues accrue at the local community/household level – national governments and local communities may therefore be in conflict over perceptions of the most economically rational use of the forest (Malleson; Shanley)."

Notes: This book is a compilation of presentations from "The International Expert Meeting on Non-Wood Forest Products in Central Africa." It is an excellent resource and can be downloaded from the website indicated in PDF format. There are a total of 28 papers under the sections "Ecological Issues," "Socio-Political Issues," "Market-Economic Issues," and "Networks and Information Exchange."

Nonwood Forest Products Publications website. Hosted by FAO, Rome.

Web/URL's: <http://www.fao.org/forestry/FOP/FOPW/NWFP/public-e.stm>

Contact/Web Master: Forestry-www@fao.org

Keywords: bibliography/website

Abstract: "Specific categories of NWFP and important topics for their development are highlighted in the FAO Non-Wood Forest Products Series. Twelve volumes have been published to date. In addition to the Non-Wood Forest Products Series, a large number of other publications related to NWFP, including working documents, studies, field reports, and other "grey" literature, are produced by FAO through various programs within the Forestry Department and the Regional Offices.

"*Non-Wood News* the annual bulletin on NWFP is also available online. For a general list of recent NWFP publications (journal articles, reports, books, etc, including FAO publications.), click on NWFP bibliography."

Notes: This website is part of the massive FAO website. Most publications are global in scope and they are available in HTML format.

Ntamag, C.N. 1997. Spatial Distribution of Non-timber Forest Product Collection: A Case Study of South Cameroon. The Netherlands: Department of Forestry, Wageningen Agricultural University, 76 p. Thesis.

Keywords: Cameroon/collection/household/women

Abstract: Excerpted from the Summary "The objectives of the study are firstly, to get more insight into the place where NTFP's are found, and

secondly, to determine which factors influence the collection boundaries of NTFP's. Attention was given to ecological, social factors, the nature of the tree and the nature of the tree products, and that of their uses. "The study was carried out from July to September 1996 in the village of Nyangong, with 53 respondents, composed of 28 women and 25 men, together representing 25 households. Information was gathered through the literature, open interviews, participant observations, questionnaires and diaries written during a five-week period in six households."

NTFP's: United States website. Hosted by Institute for Culture and Ecology, Portland, Oregon.

Web/URL's: <http://www.ifcae.org/ntfp/>

Contact/Web Master: usntfpwebmaster@ifcae.org

Keywords: bibliography/collection/conservation/honey/insects/medicinal/website/economic/data base

Abstract: "This website contains conservation and development information on commercial, recreational, and subsistence extraction of nontimber forest products (NTFP). A diverse range of areas are covered including cultural, ecological, economic, geographic, and political. Though the primary focus of this website is on the U.S., international researchers will find plenty of useful information. To learn more about NTFP's, please explore some of the hundreds of pages in this website."

Notes: This new searchable Internet bibliography currently contains over 1,400 references and more are added regularly. Also included are electronic bulletin boards, a comprehensive database of NTFP links, and a products database. It will receive periodic updates so the Africa content is likely to increase.

Nweze, N.J. and Ejiogu, A.O. 1997. Assessing the Economic Value of Non-Timber Forest Products in South Eastern Nigeria. Nsukka, Nigeria: Bioresources Development and Conservation Program. 28 p.
Keywords: contingent valuation/economic/medicinal/valuation/Nigeria
Notes: The authors used economic measures, including contingent valuation techniques, to estimate the value of NTFP's in 15 villages. The paper is quite technical and there is an emphasis on medicinal NTFP's.

Nzoooh Dongmo, Z.L.; Nkongmeneck, B.; Fotso, R.C. 1999. Diversité, biotope, préférentiel et répartition géographique des rotins de la Réserve de faune du Dja et ses environs. Paper presented at Séminaire FORAFRI de Libreville - Session 2: Connaissance de l'écosystème, 1999, at Libreville, Gabon. 18 p.

Keywords: Cameroon/rattan/rotin/rotins/regeneration

Abstract: "Using transects in different vegetation types in the area of the Dja Reserve, the authors identified nine species of rattan in a variety of forest types. The study showed that these species require light to grow and reach maturity and that regeneration is limited by wet soils."

Notes: Publication date is estimated.

Obama, C. 1999. Estudio de Mercados de Productos Forestales No-Maderables del Bosque (PFNM's). Situación del Sector en Guinea Ecuatorial. Bata, Equatorial Guinea and Washington, DC: CUREF and CARPE. 19 p.

Keywords: Guinea Ecuatorial/Mercados

Abstract: Excerpted from the Objetivos de estudio: "Particularmente para Guinea Ecuatorial, este estudio reviste un carácter de importancia excepcional, constituye el primero del sector de PFNMs de carácter oficial y global desde hace más de 30 a`os. Se espera que los resultados puedan infundir intere`s y permitir un desarrollo del sector sin comprometer el medio ambiente."

OFI Literature and Publications website. Hosted by Oxford Forestry Institute, University of Oxford, Oxford.

Web/URL's: <http://www.plants.ox.ac.uk/ofl/pubs/index.htm>

Contact/Web Master: ofi@plants.ox.ac.uk

Keywords: data base/website/research

Abstract: Excerpted from About the OFI: "The Institute's information services, provided in conjunction with CAB International, offers access to all material abstracted in Agroforestry Abstracts, Forestry Abstracts and Forest Products Abstracts, and to a wealth of other forestry literature."

Notes: Browsing this nonsearchable website will provide access to publications lists, databases, and descriptions of ongoing research projects.

Okafor, J. and Ham, R. 1999. Identification, Utilization, and Conservation of Medicinal Plants in Southeastern Nigeria, In: Issues in African Biodiversity. Washington, DC: BSP. 3: 1-7.

Keywords: Aframomum/agriculture/botany/children/collection/Combretum/commercialization/conservation/deforestation/demand/drug/ecology/economic/employment/ethnobotany/exploitation/food/fruits/Garcinia/gather/Gnetum/growth/honey/income/Irvingia/kernel/market/markets/medicinal/medicinal plants/medicine/overexploitation/palm wine/policy/preparation/propagation/research/rural/sociology/Tetrapleura/Nigeria

Web/URL's: <http://www.bsponline.org/publications/showhtml.php3?38>

Abstract: Excerpted from the Introduction: "In Nigeria, most of the original forests have been either completely lost or badly degraded, and there is an urgent need both to protect the remaining forests and to preserve the traditional knowledge of their use. This article reports a study conducted by Dr. Jonathan C. Okafor of the uses of indigenous plants for medicinal purposes in southeastern Nigeria. The main aims of the study were to:

- identify plant species used for medicinal purposes;
- document how they are used;
- investigate the importance of medicinal plants to the local people;
- examine ways to conserve medicinal plants and to record and preserve the knowledge of their use."

Notes: This article includes a listing of 55 plant species and their uses.

OneWorld Online website. Hosted by OneWorld, Oxon, United Kingdom.

Web/URL's: <http://www.oneworld.net>

Contact/Web Master: justice@oneworld.org

Keywords: website/search

Abstract: Excerpted from About Us: "OneWorld Online was publicly launched to a packed house in January 1995 by Terry Waite, CBE, at the Foreign Press Association in London. Herbert Girardet, distinguished environmentalist and film-maker, declared that he 'felt present at an historic moment.'

"At its simplest, the Trust intended to publish information about global issues at low cost for development NGO's and others whose remit it was to get such material out to the world. This would be done by the creation

of World Wide Websites on the Internet. These sites contain text and pictures and, increasingly, audio and video clips. The user follows links - to related text, pictures, audio, video etc. - simply by clicking on them."

Notes: While this website has a social/environmental focus, it has an African edition link and a test search on "NTFP" produced a number of hits.

Orchardson, N.Q. 1995. Farming Systems Support: Budgrafting Bush Mango. Enugu, Oban Hills Program of the Cross River National Park and FAME Agricultural Centre. 29 p.

Keywords: bush mango/extension/grafting/training

Notes: This "how-to" manual is exceptionally well written for use in farmer training courses. It is comprehensive and concise with abundant line drawings.

Pagezy, H. 1993. The Importance of Natural Resources in the Diet of the Young Child in a Flooded Tropical Forest in Zaire. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; Hadley, M., eds. *Man and the Biosphere Series*. Paris: UNESCO. 13: 1-15.

Keywords: agriculture/child/children/food/nutrition/trade/Zaire

Abstract: Excerpted from the article: "Weaning patterns largely depend on three factors: on the availability of suitable weaning foods (from foraging, agriculture, rearing animals or trade, especially animal products); on the choice made by societies with respect to their cultural values; and on the functional maturity of the child, as perceived by the mother. In this context, natural resources may be of great importance, as observed among the Ntomba living in the flooded forest of Zaire, where field work has been conducted since the early 1970s."

Papadopoulos, V. and Gordon, A. 1997. Non-Timber Tree Products: A Partial Inventory of Products Available in the Mount Cameroon Area. NRI Socio-economic Series 11. Chatham, UK: NRI. 14 p.

Keywords: agriculture/Cameroon/food/inventory/location/market/markets/policy/production/research/rural

Abstract: "The value of tree-growing on tropical farms, for subsistence uses, commercial sale and environmental stability, has been increasingly

argued in recent decades. But while impressive progress has been made in identifying a wide range of tree production systems, there has been very little associated research on the market potential of these systems. The failures of many sustainable agriculture, agroforestry, and community forestry programs have now been attributed to 'market failures.' "The Natural Resources Institute is collaborating with the International Food Policy Research Institute on a project funded by the Overseas Development Administration (UK) to explore domestic market potential for tree products from farms and rural communities. Field work is being conducted in Cameroon and Brazil.

"This partial inventory of nontimber tree products (NTTP's) is the product of the initial field work in 1995 in the southwest province in Cameroon, where Mount Cameroon is located—an area which is recognized globally for its biodiversity. The inventory was derived from visits to markets and villages bordering the forest, interviews with key informants (particularly traders and forestry professionals), and from secondary sources. Approximately 300 products available in the Mount Cameroon area are listed by their local name. Additional information is provided, where available, on Latin names, end use, product source, seasonality, location of markets, and availability in markets.

"The inventory has been reproduced now in response to the growing interest in nontimber tree products and, in particular, interest in the highly biodiverse flora of the Mount Cameroon area."

Notes: While the listing is extensive, much of the product source, final market destination, and Latin names information in the matrix is not available.

Pelkey, N. and Ali, R. 1996. Problems with the Use of Nontimber Tropical Forest Products in Ecodevelopment: A Bioeconomic Approach. Davis, CA: University of California at Davis. 11 p.

Keywords: economic/income/market/monitoring/economic potential

Abstract: "Hall and Bawa (1993) warn that using nontimber forest products (NTFP's) as an alternative source of income in eco-development schemes may lead to the same overharvesting problems that traditional timber products have suffered in the last century in the tropics. They suggest that careful monitoring and management may be necessary to avoid biological overharvesting of these new ecoresources. Monitoring and managing these resources may overcome the problems of biological overharvesting, but it may not come cheaply. This paper, therefore, takes their warning a step further by showing that the economic potential for

local management will only exist under a certain combined set of ecological and economic conditions. Well-intended development schemes that fail to account for the renewable nature of these resources, the economic characteristics of the market for these goods, and the social characteristics of the manager and harvesters may be self-defeating.”

Notes: Publication date is estimated. There are few papers that discuss the bioeconomic approach. This paper does not focus on any given region and uses generalized computer models extensively.

People and Plants Online: Resources website. Hosted by Royal Botanic Gardens Kew, WWF/International, UNESCO.

Web/URL's: <http://www.rbgekew.org.uk/peopleplants/resources.htm>

Contact/Web Master: peopleandplants@cybernet.net.ma

Keywords: community development/conservation/ethnobotany/policy/research/website/training

Abstract: “The coordinators of the People and Plants Initiative, inspired by field projects around the world, have created a diverse range of training and educational materials on ethnobotany, conservation and community development. We refer to these materials as “resources” in the sense of something that people can access when in need or difficulty. We hope that you find them useful as you design field projects, address policy issues, or simply deepen your knowledge of people and plants.

“As time goes on, you will have complete access to most of these resources online, including curricula, discussion papers, the People and Plants Handbook, lessons learned, regional activity reports, research techniques, and working papers. Other materials—such as the Methods Manuals and Videos—may be ordered from the appropriate source.”

Notes: This nonsearchable website provides hyperlinks to numerous NTFP-related publications. Many of the publications are in HTML format.

Peters, C.M. 1994. Sustainable Harvest of Non-Timber Plant Resources in Tropical Moist Forest: An Ecological Primer. Washington, DC: BSP. 48 p.

Keywords: ecology/exploitation/forest management/monitoring/sustainability/sustainable harvest/extension/conservation/impacts/website/entrepreneur/business

Web/URL's: <http://www.bsponline.org/publications/english.php3>

Abstract: Excerpted from the Introduction: “The main objective of this report is to give a concise overview of the ecology and exploitation of non-timber tropical forest resources in terms that can be easily understood by non-specialists. The material has been written with two potential audiences in mind. In the first group are the innumerable NGO’s, individual entrepreneurs, “green” businesses, and other commercial concerns who are currently promoting the increased exploitation of non-timber tropical forest products. The second group includes local community organizations, extension agents and forest managers who are already actively involved in the harvest of these resources. Although the setting, frame of reference, and scale of operations may be different in each case, both groups have a vested interest in the long-term sustainability of tropical forest exploitation.

“The controlled exploitation of non-timber forest products holds great potential as a method for integrating the use and conservation of tropical forests. This report attempts to narrow the gap between the potential and the reality of this land-use practice. The following pages provide a general background on the ecology of non-timber resources and present a series of management operations designed to minimize the impact of harvesting these resources. The procedures described are not a blueprint for eliminating the potential impacts on all components of a forest ecosystem (e.g. soils, hydrology, or associated plant and animal species), or for maintaining forests in a pristine condition. The immediate objective being addressed here is simply that of defining a level of resource harvest that can be sustained over time by the plant populations being exploited.”

Notes: This manual can be downloaded (PDF or HTML format) or ordered from the website indicated. It draws largely from examples in Asia and South America.

Pierce, A.R. 1999. The Challenges of Certifying Nontimber Forest Products. *Journal of American Forestry*. February. 34-37 pp.

Keywords: certification/economic

Web/URL’s: arpierce@together.net

Abstract: “Certifying the ecological, economic, and social aspects of nontimber forest product management is complex and requires prudent application. The social issues surrounding access and utilization of nontimber forest products, and the informal economic systems under which many of these goods are traded, may be poorly addressed by a market-based initiative such as certification. Nevertheless, certification

may benefit certain products, and the process of developing and testing certification standards for best management practices on nontimber forest products will benefit researchers and managers, and perhaps also the communities that harvest these critical forest resources.”

Pouna, E. 1994. Produits Forestiers Non Ligneux: Le Cas du Cameroun. Paper presented at Extraction and Potentialities of Multiple Use Forest Reserves in Africa, 1994, Naro Moro, Kenya. 5 p.

Keywords: Cameroun

Notes: The author summarizes the “problematique du développement des produits forestiers non-ligneux,” “stratégies d’actions,” “recherche et produits,” and “suggestions et orientation.”

Pour Contacter ECOFAC website. Hosted by ECOFAC.

Web/URL’s: <http://www.ecofac.org/Divers/Adresses.htm>

Contact/Web Master: coordination@ecofac.org

Keywords: bibliography/Cameroun/chassé/Congo/Gabon/Guinée Equatoriale/parc/RCA/website

Notes: This website lists each ECOFAC office by country. For each country, there is a hyperlink to a list of reports for that country, some of which can be downloaded. Each country’s listing also includes a “Liste des articles relatifs à la composante parus dans Canopée.”

Profizi, J.P. and Makita-Madzou, J. 1996. Utilisations des Arecaceae (Palmiers) au Congo par des Téké Tsaaya. In: *Bien Manger et Bien Vivre: Anthropologie alimentaire et développement en Afrique inter-tropicale: du biologique au social*. Froment, A.; De Garine, I.; Ch. B. Bikoi; and Loung, J.F., eds. ORSTOM. 11 p.

Keywords: artisanat/children/Congo/food/inventory/production/Pygmées/enfant/pygmy/fruits

Abstract: FRENCH: Au Congo, les Arecaceae fournissent de nombreux produits aux habitants des forêts, bantou comme pygmées. L’inventaire de ces utilisations sera fait ici à travers les pratiques d’une population, les Téké-Tsaaya, seul groupe de l’ethnie Téké qui vit en zone forestière. La seule famille des Arecaceae est utilisée à la fois pour l’alimentation (méristèmes, fruits oléagineux ou sucrés, boissons alcoolisées, sels végétaux et produits secondaires), pour servir de matériaux de construction et de matières premières pour l’artisanat, particulièrement les fibres d’usages très divers. Ces produits participent directement ou

indirectement à l'équilibre alimentaire des populations forestières, particulièrement des enfants. Différentes techniques de production ou de fabrication sont décrites et les potentialités de plusieurs produits sont relevées.

ENGLISH: "In Congo, Arecaceae supplies a lot of products to the forest dwellers: Bantu as well as Pygmies. The inventory of these uses will be studied here through the habits of a population, the Téké-Tsaaya, the only group of the Téké tribe that lives in the forest. Depending on the regions of the country, the species and its derivatives can be used as food (meristems, oleaginous or sweet fruits, alcoholic drinks, vegetable salt, and secondary products), building materials, and raw materials for handicraft, especially fibers. These products directly or indirectly have a positive impact on the feeding of forest populations, especially the children. Different production and manufacturing techniques are described, and the potentials of many products are brought out."

Notes: This is a French-English publication

Profizi, J.P.; Makita-Madzou, J.; Milandou, J.; Karanda, C.N.; Motom, M.; Bitsindou, I. 1993. Ressources Végétales Non Ligneuses des Forêts du Congo. Rapport d'Etude. Brazzaville, Université Marien Ngouabi. 67 p.

Keywords: alimentaires/Congo/pharmacopée/plantes médicinales

Abstract: Excerpted from the Introduction: "La deuxième partie de ce travail consiste en plusieurs listes réunies en quatre annexes et deux index. Trois listes de plantes utiles (classées par ordre alphabétique de genres et d'espèces) ont été rédigées plantes alimentaires (annexe 1), plantes à usages techniques (annexe 2) et plantes médicinales (annexe 3). L'annexe 4 récapitule, par organe et type d'utilisation, l'ensemble des espèces citées dans les trois premières tandis que les index (1: plantes classées par familles, 2: plantes classées par espèces) permettent de se reporter dans les annexes correspondantes selon l'information recherchée.

"Au total, 593 espèces utiles ont été recensées au cours de cette étude, soit 14 % des 4 244 espèces enregistrées pour l'ensemble de Congo par Sita & Moutsamboté (1988). Ce très fort pourcentage, sans comparaison avec d'autres pays à notre connaissance, ne doit pas faire oublier que cet inventaire est sûrement incomplet et que toutes ces espèces ont souvent

plusiers usages. Nous avons recensé 166 plantes alimentaires, 176 à usage technique et 463 utilisées en pharmacopée traditionnelle.”

Notes: The body of this report is a narrative describing the results of the nationwide survey of NTFP's. It provides a good overview of a large number of plants and their products. The annexes total approximately 100 pages.

Publications of the Tropenbos-Cameroon Program website. Hosted by Tropenbos, Wageningen, the Netherlands.

Web/URL's: <http://www.tropenbos.nl/tropenbos/tropenbos-home.html>

Contact/Web Master: j.b.maas@iac.agro.nl

Keywords: Cameroon/website

Notes: This website has a long list of publications, a number of which address NTFP's in Central Africa directly. These publications can be ordered from the website. To get to this website, one must navigate from the home page through the “Tropenbos Cameroon Program” page to the “Publications” page.

Ramos-Elorduy, J. 1993. Insects and the Diet of Tropical Forest Peoples in Mexico. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F; Pagezy, H.; Semple, A.; and Hadley, M., eds. *Man and the Biosphere Series*. Paris: UNESCO. 13: 1-8.

Keywords: food/insects/preparation/preservation/storage

Abstract: Excerpted from the Introduction: “The choice of which insects are eaten, and how, in different societies depends on habitual preferences, and the availability of surrounding food resources in the ecosystem. Many tropical forest peoples perceive insects as a renewable resource, and have a detailed understanding of how to exploit the tremendous richness of insect species. Insect gathering constitutes an economy in itself and is to some extent commercialized. Many methods of preparation, preservation and storage of insects have been developed, with the aim of providing food at lean times of the year (Ramos-Elorduy, 1987).”

“The data presented in this contribution mostly concern Mexico and Central America. I also provide a comparison with other continents.”

Raponda-Walker, A. and Sillans R. 1998. Les Plantes Utiles du Gabon. Libreville: Fondation Raponda-Walker.

Keywords: chasse/Gabon/research

Notes: This French language reference book is a reprint of a 1961 edition. It contains 7,000 entries based on 30 years of research by André Raponda-Walker. From the publisher: “La forêt gabonaise est une « inépuisable pharmacie » dont le lecteur est invité à découvrir la richesse. Il y trouvera aussi une mine d’informations sur toutes les utilisations qu’elle permet à l’homme d’en tirer: outils de chasse et de pêche, utensiles de cuisine, instruments de musique, objets rituels ou de parure...”

Redford, K.H. 1993. Hunting in Neotropical Forests: A Subsidy from Nature. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; and Hadley, M. eds. *Man and the Biosphere Series*. Paris: UNESCO. 13: 1-20.

Keywords: conservation/food/hunting/neotropical/trade

Abstract: Excerpted from the Introduction: “Although the trade in animals and their products is an important topic, I deal in this contribution only with the hunting of animals for meat (for a discussion of hunting in the neotropics for skins and furs, see Redford and Robinson, 1991). This contribution includes six issues: (1) parameters for estimating the nature and extent of hunting in the neotropical forests; (2) questions of hunter selectivity; (3) the importance of subsistence hunting; (4) the impact of subsistence hunting on the conservation of animals and of the tropical forest itself; (5) the social values of hunting; and (6) a brief comparison of neotropical hunting with that of palaeotropical forests.”

Rene, M. 1996. Etudes Préliminaires pour la Valorisation des Produits Forestiers Végétaux Non Ligneux dans la Région de Lomié: Project UICN/Dja. Rapport de Stage Pre-Professionnel. Cameroon, Ecole des Eaux et Forêts, Service des Etudes et des Stages. 27 p.

Keywords: Cameroon/valorisation

Notes: This report is the result of a Cameroonian forestry student’s internship. It provides some information on the NTFP’s used around Lomie to the east of the Dja Reserve.

Renkow, M. and Vosti, S.A. 1995. Joint Production, Output Supply and Product Markets: Research and Policy Implications for Non-Timber Tree Products. Raleigh, NC: North Carolina State University. 12 p.

Keywords: economic/household/impacts/market/markets/policy/production/research

Abstract: “The purpose of this paper is to draw together the key economic concepts required to fully understand the kinds of trade-offs and incentives implicit in joint production systems. These concepts will be discussed within the context of agroforestry systems, specifically the multiple nontimber tree products that may be harvested from a particular species of tree or heterogeneous stand of trees. The paper is organized as follows. In section II we define some key terms and concepts that are used throughout the paper. In section III, we discuss the microeconomics of household supply decisions made in the joint production setting that characterizes NTTP production, Section IV addresses issues related to the timing of harvesting NTTPs, with special emphasis on decisions over harvesting trees for timber versus nontimber uses. Section V discusses the impact of government interventions in NTTP markets on NTTP-producing households and offers guidance on the kinds of research tools needed for assessing those impacts. Concluding remarks are offered in the final section of the paper.”

Notes: Publication date is estimated.

Research Needs for Bamboo and Rattan to the Year 2000. 1994. Tropical Tree Crops Program. International Fund for Agricultural Research. 81 p.

Keywords: proposal/rattan/research

Notes: While primarily a research proposal with an Asian focus, some may find this document useful because it describes African and Asian rattans and their importance.

Ros-Tonen, M.; Dijkman, W.; and van Bueren, E.L. 1995. Commercial and Sustainable Extraction of Non-timber Forest Products: Towards a Policy and Management Oriented Research Strategy. Wageningen, Netherlands: The Tropenbos Foundation. 32 p.

Keywords: exploitation/policy/research/website

Web/URL's: <http://www.tropenbos.nl/tropenbos/tropenbos-home.html>

Notes: This short book provides a good overview of commercial NTFP exploitation. The scope is global with an emphasis on humid forests. It

also has a strong references section and can be purchased at the website indicated.

Ros-Tonen, M.; van Andel, T.; Assies, W.; W. van Dijk, J.F.; Duivenvoorden, J.F.; van der Hammen, M.C.; de Jong, W.; Reinders, M.; Rodriguez Fernandez, C.A.; and van Valkenburg, J.L.C.H., eds. 1998. Methods for Non-Timber Forest Products Research: The Tropenbos Experience. Wageningen, Netherlands: The Tropenbos Foundation. 31 p.

Keywords: Cameroon/household/market/market survey/research/sustainable harvest/website

Web/URL's: <http://www.tropenbos.nl/tropenbos/tropenbos-home.html>

Notes: This book has short descriptions on methodologies to determine the availability of natural resources, to establish sustainable harvest levels, for market surveys, to study NTFP-based household livelihood strategies, and for participatory planning. It can be purchased at the website indicated. While Tropenbos has projects in Cameroon, none of the examples used in this report are from Central Africa.

Ruiz Pérez, M. 1998. "Female Captains" Govern NTFP Trade in Cameroon. *CIFOR Newsletter*; 1998. 20: 3-3.

Keywords: Cameroon/economic/market/tontine/trade/women

Notes: This one page article documents that women "... are far more actively engaged in NTFP trade than has been commonly recognized, and yet their share of decision-making power at a more macro level does not correspond with their economic contribution."

Ruiz Pérez, M. and Arnold, J.E.M. 1996. Current Issues in Non-Timber Forest Products Research. Research on NTFP. Jakarta . 1995 August 28 - September 2. Hot Springs, Zimbabwe: CIFOR. 264 p.

Keywords: research

Notes: These proceedings are global in scope. They provide a sophisticated and well-referenced analysis of key NTFP issues.

Ruiz Pérez, M. and Byron, N. 1999. A Methodology to Analyze Divergent Case Studies of Non-Timber Forest Products and Their Development Potential. *Forest Science*. 45(1): 1-14.

Keywords: Cameroon/case characterization/development potential/market/multivariate analysis

Abstract: “Debate currently rages over the development potential of nontimber forest products (NTFP) in tropical forests. Proponents of particular “solutions” can refer to evidence (case studies, data) that tend to support their interpretation of events and relationships. Thus, recommendations frequently depend on how data are classified and interpreted. Inaccurate or incomplete classification leads to defective subsequent theories, models, and recommendations. We present a method for classifying very divergent case-study data and some initial results as a basis for general understanding of key factors that influence a given result. Crucial issues determining outcomes of NTFP development include the nature of government involvement, distribution of property rights, the ability of local people to claim and enforce such rights, market transparency, and pressure on the resource. This paper concludes with suggestions for further testing and development of the methodology.”

Notes: This paper provides an interesting, albeit complex, analysis of case studies. Cameroon is one of the cases in the analysis.

Ruiz Pérez, M.; Ndoye, O.; and Eyebe, A. 1999. Marketing of Non-Wood Forest Products in the Humid Forest Zone of Cameroon. *Unasylva*. 50(3): 12-19.

Keywords: Cameroon/conservation/international trade/market/marketing/markets/research/trade

Abstract: Excerpted from the first page: “The article summarizes the main results of studies by the Center for International Forestry Research (CIFOR) that characterize the performance and operation of these markets [markets in Cameroon’s humid forest zone], estimate the volume and value of their transactions and the importance of their international trade, and analyze their spatial characteristics. Evidence of mounting pressure on the NWFP resource base suggests the need for improved management systems to guarantee a stable supply and to reconcile the improvement in livelihood with forest conservation.”

Schneemann, J. 1995. Exploitation of Moabi in the Humid Dense Forests of Cameroon. Harmonization and Improvement of Two Conflicting Ways of Exploitation of the Same Forest Resource. *BOS NiEuWSLETTER*. 14(31): 20-32.

Keywords: Cameroon/conflict/economic/exploitation/*Irvingia*/kernel/logging/market/quantitative/regeneration/bush mango/toxisperma/*Baillonella toxisperma*/*Irvingia gabonensis*

Abstract: "This article describes how the moabi-tree (*Baillonella toxisperma*) is used by the population in east Cameroon and how the wood is exploited by logging companies. The interests of the population and the logging companies are evaluated.

"For many generations, the edible oil is an important nontimber forest product (NTFP) for the population, besides the kernels of the bush mango (*Irvingia gabonensis*), bush meat, and many other NTFP. They consume the edible oil and sell the surplus. On the other hand, moabi is logged because its timber has a good market, especially in southern Europe; therefore, the tree has already become rare in many parts of Cameroon (south, southwest, Littoral, and central provinces) and as a consequence the edible oil too. Thus the two ways of exploitation are competing for the same natural resource. This has resulted in conflicts between the logging companies and the local communities, most often defending "their" moabi trees in vain.

"Based on quantitative data, a comparison is made between the economic value of the timber and that of the edible oil, which is extracted from the seeds. It is argued that moabi, if exploitation continues in the same way, will disappear in a large part of its original area of distribution as a result. Causes are the vulnerable regeneration of the species and the exploitation without (sufficient) restrictions. It is discussed that a sustainable use of moabi is possible, safeguarding and strengthening both the oil and timber interests. Finally, some measures are suggested that could enhance a more sustainable way of exploitation of moabi."

Schneemann, J. and Dijkstra, W. 1994. Rapport sur la Commercialization des Produits de Cueillette et des Articles d'Artisanat dans la Province de l'Est: Arrondissements de Mbang et Yokadouma. Yaoundé, SNV and MINASCOF, Projet Intégration Socio-économique des Pygmées Baka. 67 p.

Keywords: artisanat/commercialization/marketing/Pygmées

Notes: This report describes an attempt to improve the marketing of

produce among the Baka and Bantou over 6 years. The report includes 37 pages of annexes showing study data and analysis.

Schröder, J.M. 1998. Non-timber Forest Products and Their Potential for Preserving Tropical Humid Forests: Examples from Cameroon and Ecuador. *Plant Research and Development*. 47/48: 108-117.

Keywords: Cameroon/conservation/drug/exploitation/income/market/markets/pharmaceutical/processing/production/*Prunus*/*Prunus africana*/deforestation

Abstract: “It is generally assumed that nontimber forest products can contribute to the conservation of tropical ecosystems. Many products play an important role in the livelihood of forest dwellers; some products are well-established world market products.

“The article elucidates examples of nontimber forest products from Cameroon and Ecuador. In Cameroon, the bark of *Prunus africana* is harvested for the production of pharmaceutical drugs. The unsustainable method of exploitation may cause the extinction of this tree species that was abundant in Cameroon’s natural forests until some years ago. It is proposed to integrate *P. africana* in communal agroforestry systems. The introduction of a so far, underestimated nontimber forest product into international markets is presented with the example from Ecuador.

“The Inchi-tree (*Caryodendron orinocense*) produces a tasty nut and good quality oil. Neither product has been considered valuable by the local population. With support of a technical cooperation project, there was a successful drive to organize harvest, process, and export the nut. Meanwhile, farmers recognize the tree as a source of income. An alternative to deforestation is herewith offered.”

Shiembo, P.N. 1997. Domestication of *Gnetum Spp* by Vegetative Propagation Techniques. Paper presented at Workshop on African Indigenous Vegetables. Limbe, Cameroon. 5 p.

Keywords: Cameroon/domestication/exploitation/*Gnetum*/Limbe/research/Vegetative Propagation/propagation/cuttings/Nigeria

Abstract: “The forests of Cameroon are fast disappearing under the pressures of timber exploitation, establishment of new farms, new roads, etc. The products that are found in these forests are disappearing along with them. This means that those local communities which depend on

these products for their livelihood will suffer. *Gnetum africanum* and *G. buchholzianum* are two valuable vegetable species that may disappear as happened in Nigeria, where they are rarely seen nowadays, which is a vast difference from only 10 years ago.

“To counteract this threat, an effort is under way in Cameroon to domesticate these two species with the aim of introducing them as a new crop for farmers. The technique being used to achieve this goal is vegetative propagation by rooting leafy vine cuttings.

“After the success recorded in the domestication of the two *Gnetum* species in the propagation unit and the nursery in Kumba, the next step is to get the cloned material to the tanners. However, the technique for establishing them on the farms has not yet been developed. Research efforts need to be made to achieve this in order to save these natural resources from becoming extinct.”

Shiembo, P.N.; Newton, A.C.; and Leakey, R.R.B. 1996. Vegetative Propagation of *Gnetum africanum* Weiw., A Leafy Vegetable from West Africa. *Journal of Horticultural Science*. 71(1): 149-155.

Keywords: Cameroon/domestication/*Gnetum*/Vegetative Propagation/propagation/cuttings

Abstract: “Vegetative propagation of the edible climber *Gnetum africanum* Weiw. was examined using a low technology nonmist propagation system in Cameroon. Leafy stem cuttings taken from vines growing naturally in a forest reserve were allocated randomly for experimental treatments. Three separate experiments were tested, respectively: (i) six propagation media, namely sawdust (SD), fine sand (FS), medium sand (MS), gravel (G), and 50:50 mixtures of G:SD and MS:SD; (ii) five IBA concentrations, namely 0, 8, 40, 200 and 250 µg IBA dissolved in 10 µl of alcohol; and (iii) five leaf-area treatments namely 0, 12.5, 25, 50, and 80 cm², obtained using paper templates. Propagation medium had a significant effect on final rooting percentage, values ranging from 43—82 percent in MS:SD and SD, respectively.

“Although IBA had no significant effect on final rooting percentage, root number per rooted cutting was positively related to IBA concentration, values ranging from 6.8–13.8 in the 0 and 250 µg treatment respectively.

“Rooting percentage and root number were positively related to leaf area with no rooting recorded in completely defoliated cuttings. These results indicate that *G. africanum* may be successfully propagated using these techniques, which should greatly facilitate the domestication of this species.”

Silou, T. 1996. Le Safoutier (*Dacryodes edulis*): un arbre mal connu. *Fruits*. 51(1): 47-60.

Keywords: botany/*Dacryodes edulis*/*Dacryodes*/location/pest/process-
ing/production/bush butter/Safoutier/*Dacryodes edulis*

Abstract: “The bush butter tree has long been domesticated in the Gulf of Guinea region, where its edible fruit is highly appreciated. The present bibliographical review summarizes published data on some characteristics of this still relatively unknown tree species with considerable potential: origin, distribution, botany, vegetative and sexual propagation, diseases, uses of the plant, development, and processing.”

Notes: A French language publication.

Sizer, N. 1993. Socio-Economic Aspects of Extractivism in the Jaú National Park. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; and Hadley, M. eds., *Man and the Biosphere Series*. Paris: UNESCO. 13: 1-8.

Keywords: ecology/food/national park/nutrition

Abstract: Excerpted for the Introduction: “A total of 51 families (mostly living along the Rio Jaú, some from the more populous, neighbouring Rio Unini) were interviewed using a 47 point questionnaire. This constitutes about 15-20% of the total population living in and on the boundaries of the National Park. Information was collected in a range of categories designed to give a general picture of the health and educational status of the population, as well as their housing conditions, nutrition and their role in the ecology of the Park. The interviews took place during August 1990 and January 1991.”

Southgate, D.; Coles-Ritchie, M.; and Salazar-Canelos, P. 1995. Can We Save Tropical Forests by Harvesting Non-Timber Products? Case Study No. 3. Columbus, OH: Ohio State University. 12 p.

Keywords: conservation/markets/valuation/vegetable ivory

Notes: This paper argues that “Extracting non-timber resources may, indeed, contribute very little to rainforest conservation.” As their example, the authors use the case of vegetable ivory in Ecuador. The paper highlights some of the more difficult issues regarding valuation of NTFP’s such as price fluctuations, property rights, and destructive harvesting.

Sunderland, T. 1997. Technical Note 1: Field Guide to Rattan Genera and Rattan Collecting in West & Central Africa. Interim Progress Report for the Central African Regional Programme for the Environment (CARPE) and the United States Forest Service Office for International Programs. Kew, UK: Royal Botanic Gardens, African Rattan Research Program. 9 p.

Keywords: botany/identification/rattan

Notes: This paper provides a botanical description of rattans. There is also a key to the west African genera and a simple guide to collecting herbarium specimens of rattan.

Sunderland, T. 1997. Technical Note 2: The Abundance and Distribution of Rattan Palms in the Campo Fuanal Reserve, Cameroon and an Estimate of Market Value. Interim Progress Report for the Central African Regional Programme for the Environment (CARPE) and the United States Forest Service Office for International Programs. Kew, UK: Royal Botanic Gardens, African Rattan Research Programme. 12 p.

Keywords: Cameroon/*Laccosperma secundiflorum*/market/rattan/yield/*Laccosperma*

Abstract: Excerpted from the results section “Of the four species present, *Laccosperma secundiflorum* is by far the most abundant and confirms the visual dominance of the species in this forest formation. Of the other three species, only *Eremospatha hookeri* has reached the adult stage of development, with both *Oncocalamus mannii*, a far more light demanding species, and *Laccospenna laeve* occurring as regenerants only.

“The stocking on this plot can be summarised as follows: 4 species were recorded, representing 3 genera; 4 clumps and 56 adult stems/ha were enumerated, totalling a cumulative stem length of 1 196m.

“The average yield per hectare was found to be 76,500 CFA.”

Sunderland, T. 1998. Estudio Preliminar de los Mercados de Productos No-Maderables del Bosque del Rio Muni, Guinea Equatorial. Informe Preparado para: The Central African Regional Programme for the Environment (CARPE). Washington, DC: USAID. 26 p.

Keywords: comercio/deforestación/deforestation/Equatorial Guinea/Guinea Equatorial/market/Mercados/trade/Guinea Ecuatorial

Abstract: An excerpt from the Conclusions section: PORTUGUESE: “La pequeña población y la riqueza de recursos biológicos de que disfruta Guinea Ecuatorial es capaz de proporcionar una “página en blanco” para la promoción del comercio de PFNMs que sin duda proporcionarán una oportunidad u’ mca para el desarrollo del sector hasta tal punto, que Si se lo diseñara de forma sensible y pragmática, podría contribuir realísticamente a la mitigación de la deforestación y otros procesos de explotación destructiva del bosque.

ENGLISH: “The small population and wealth of biological resources of Equatorial Guinea could provide a ‘blank page’ for the promotion of the NWFP trade that could unquestionably provide a unique opportunity for the development of the sector such that it could, if designed sensitively and pragmatically, realistically contribute to the mitigation of deforestation and other destructive forest exploitation.”

Notes: This report is meant to provide basic knowledge of the sector and to generate interest in further study. It includes an overview of the region, a description of the market study, a well-developed overview of local NTFP’s, and a discussion of the findings. This report is also available in English and French.

Sunderland, T. 1998. The Rattans of Rio Muni, Equatorial Guinea: Utilisation, Biology and Distribution. Report for the *Proyecto Conservacion y Utilization Forestales de Guinea Ecuatorial* (CUREF) and the *Ministerio de Pesca Forestal Guinea Ecuatorial*. Kew Gardens and University College, London, UK: African Rattan Research Programme. 28 p.

Keywords: Equatorial Guinea/exploitation/household/rattan/trade/Guinea Equatorial/website/conservation/Guinea Ecuatorial

Abstract: “Rattans are one of the most important nontimber forest products of the continental region of Equatorial Guinea and play an integral part in indigenous subsistence strategies. Rattan products also form the basis of a thriving cottage industry centered in Bata producing large quantities of chairs, tables, and other household items for sale. This trade has grown dramatically in recent years due to the increasing number of expatriates arriving to work in the region and also because cane furniture has become fashionable with Guineans and residents from other African countries.

To reflect the importance of rattan as a nontimber forest product, the CUREF project commissioned this study to provide a wider picture of the rattans of Rio Muni. This report represents the findings of that mission.”

Notes: This report provides an excellent description of rattan’s current and potential economic importance, as well as the effects of exploitation on the rattan resource. It may be appearing on the Gulf of Guinea Conservation Group website at <http://www.ggcg.st/>.

Sunderland, T. 1999. African Rattans—An Annotated Bibliography. Royal Botanic Gardens. Kew, Richmond and Surry, UK: ARRP.

Keywords: bibliography/rattan/research

Web/URL’s: <http://www.africanrattanresearch.fsnet.co.uk/>

Abstract: “This bibliography provides references listed in alphabetical order with “key words” prefixing the notes to highlight the subject matter of each reference. The majority of the references are in journals and other recognized publications and are readily traced. Copies of selected “grey” reports may be obtained from the African Rattan Research Programme at afirrattan@aol.com.”

Notes: This bibliography contains nearly 100 annotated references on rattans.

Sunderland, T. 1999. Product Development of Rattan in Africa: Information Exchange and Technology Transfer between Cameroon & Malaysia. Proposal to the Central African Regional Programme for the Environment (CARPE). Kew, UK: Royal Botanic Gardens, African Rattan Research Programme. 7 p.

Keywords: Cameroon/forest management/income/proposal/rattan/Malaysia/valorisation/training

Web/URL's: Afirattan@aol.com

Notes: This is a US\$15,000 proposal to facilitate "south to south cooperation." "The main objectives of this proposal are as follows:

- To learn from the experience of SE Asian rattan researchers and to utilize this experience for the rational development of the African rattans.
- To provide the technological conditions for greater improvement of the finished rattan products of Africa, through training and technology transfer from Malaysia.
- To foster increased valorisation of rattan products for increased income generation and rational forest management."

Sunderland, T. 1999. Recent Research into African Rattans (Palmae): A Valuable Non-wood Forest Product from the Forests of Central Africa. Interim Progress Report for the Non-Central African Regional Programme for the Environment (CARPE) and the United States Forest Service Office for International Programs. Kew, UK: Royal Botanic Gardens, African Rattan Research Programme.

Keywords: conservation/ecology/exploitation/*Laccosperma secundiflorum*/market/rattan/research/rural/*Laccosperma*/taxonomy

Web/URL's: Afirattan@aol.com

Abstract: "Four genera, representing ca. 19 species, of rattan occur in West and Central Africa. African rattans form an integral part of subsistence strategies for many rural populations as well as providing the basis of a thriving cottage industry. Although many of the rattan species are used locally for a multiplicity of purposes, two widespread and common species, *Laccosperma secundiflorum* (formerly *Ancistrophyllum*) and *Ermospailha macrocarpa* are integral to both subsistence-level and commercial utilization. African rattans have long been recognized by donor agencies and national governments as having a potential role to play in the world market as well as a great role within the regional nonwood forest products (NWFP) sector. However, the

development of the rattan resource in Africa has long been hindered by a lack of basic knowledge about the exact species used, their ecological requirements, and hence appropriate management strategies that might be implemented to ensure sustainable exploitation. As increased interest is being shown in the potential role of NWFP's to contribute to the conservation and development paradigm, rattan has been one of the oft-mentioned products that could be developed and promoted in a meaningful way.

“Because of this interest, recent work by the African Rattan Research Program has concentrated on the taxonomy, ecology, and utilization of these taxa, baseline research critical for the development and promotion of any high value NWFP.”

Notes: This [in press] paper is to appear in Sunderland, T.C.H. & L.E. Clark (eds.). *The non-wood forest products of Central Africa: Current issues and prospects for conservation and development*. Rome: FAO.

Sunderland, T. 1999. The Sustainability and Certification Potential of Rattans (Palmae - Calamoideae): A Report for the Rainforest Alliance's NTFP Certification Program. Interim Progress Report for the Central African Regional Programme for the Environment (CARPE) and the United States Forest Service Office for International Programs; Royal Botanic Gardens: Kew, UK; African Rattan Research Programme. 15 p.

Keywords: certification/ecology/market/rattan/sustainability/trade/growth

Web/URL's: Afirattan@aol.com

Notes: After reviewing information on rattan distribution, ecology, uses, and trade, this paper argues that rattan could be sustainably harvested under “appropriate management regimes,” that social acceptability of certification systems needs to be considered, that there is a paucity of baseline information on growth rates and recruitment, and that the rattan markets could support certification.

Sunderland, T. and C. T. Tako. 1999. The Exploitation of *Prunus africana* on the Island of Bioko, Equatorial Guinea. Report for the People and Plants Initiative, WWF-Germany and the IUCN/SSC Medicinal Plant Specialist Group. WWF-Germany, People and Plants Initiative. 13 p.

Keywords: Cameroon/Congo/conservation/Democratic Republic of

Congo/Equatorial Guinea/exploitation/market/medicinal/*Prunus*/*Prunus africana*

Web/URL's: http://www.ggcg.st/bioko/bioko_prunus.htm

Abstract: "The bark of the montane tree species *Prunus africana* is utilized for the treatment of benign prostate hyperplasia and has a current market value of around US\$150 million per annum (Cunningnam *et al.*, 1997). Until 1992, the exploitation of *Prunus* bark was concentrated primarily in Cameroon, Kenya, Madagascar, Tanzania and, to a lesser extent, the Democratic Republic of Congo (*ibid.*).

"However, recent reports have indicated that the island of Bioko, Equatorial Guinea, is becoming increasingly important for the supply of *Prunus* bark to Europe. It may become increasingly important as supply sources from other countries become scarce or are subject to increased regulation. This report presents the findings of a field-based study of the exploitation of *Prunus africana* on Bioko in the latter part of 1998."

Notes: This report exists in Portuguese and is available on the Internet at the web address specified.

Sunderland, T. and Nkefor, J. 1996. Conservation through Cultivation A Case Study: The Propagation of *Prunus Africana*. Paper presented at The Workshop *The Conservation of Prunus Africana on Mount Cameroon*. Cameroon. 19 p.

Keywords: Cameroon/conservation/demand/exploitation/Limbe/market/medicine/*Prunus*/*Prunus africana*/pygeum/research/propagation

Abstract: "Pygeum—*Prunus africana* (Hook.f.) Kalkinan—is an Afromontane tree with a wide distribution across Africa and Madagascar. The bark of Pygeum is exploited and processed as a treatment for benign prostate hyperplasia with a market value of up to US\$25 million per annum. Cameroon is the largest exporter of raw bark, which is then processed into medicines in France and Italy. The exploitation of bark is currently being undertaken at levels that are considered unsustainable and there is a significant demand for alternative sources of supply to be developed. *Prunus africana* has been targeted by the Limbe Botanic Garden as part of its Conservation through Cultivation program to try and research the optimum method of bulk propagation of the species and subsequent cultivation requirements. The seed and seedling requirements and characteristics were analyzed and the results are presented. From field observations and subsequent nursery trials, it is clear that *Prunus africana* is amenable to intensive cultivation in either monospecific plantations or as a component in agroforestry systems."

Sunderland, T. and Nkefor, J. 1999. Technical Note No. 5. Technology Transfer between Asia and Africa: Rattan Cultivation and Processing, Report of a visit to Malaysia, October 1999; Kew, UK: Royal Botanic Gardens, African Rattan Research Programme. 18 p.

Keywords: enterprises/Malaysia/processing/rattan/research

Web/URL's: afirrattan@aol.com

Abstract: Excerpted from the Preamble "This report summarizes the activities and experiences of the key rattan research institutions of Malaysia; the Forest Research Institute of Malaysia, Kepong, and the Forest Research Centre, at Sepilok in Sabah. A number of private enterprises in Peninsular Malaysia and Sabah, concerned with both large-scale rattan cultivation and processing were also visited."

Sunderland, T. and Obama, C. 1999. A Preliminary Market Survey of the Non-Wood Forest Products of Equatorial Guinea. Yaoundé, Cameroon and Bata, Equatorial Guinea; AARP and CUREF.

Keywords: market/market survey/Equatorial Guinea/rattan/research/Cameroon/conservation/Gabon/international trade/trade/*Prunus*/*Prunus africana*/website

Web/URL's: http://www.ggcg.st/bioko/bioko_nwfp.htm

Abstract: "Knowledge of the forestry and natural resource sectors in Equatorial Guinea, aside from faunal studies, is generally poor. This despite the prolific activity in neighboring and biologically similar countries such as Cameroon, Gabon, and Congo-Brazzaville. This paper provides an introduction to the marketed NWFP sector in the continental region of Rio Muni and the island of Bioko, where the sector operates under far different conditions experienced elsewhere in Central Africa as a result of a tumultuous colonial past and a damaging post-independence era. Although there is some level of commercial exploitation and international trade of high value commodities such as *Prunus africana* and *Piper guineense*, the reliance on non-Guineans for the NWFP trade is extremely strong with many of the commonly-traded NWFP's originating from outside the country despite actually occurring in the national forests."

Notes: Available in full on the Gulf of Guinea Conservation Group website. Also published in *The non-wood forest products of Central Africa: current research issues and prospects for conservation and development*, edited by T.C.H. Sunderland, L.E. Clark & P. Vantomme. 1999. Rome: FAO.

Sunderland, T. and Profizi, J.P. 1999. Proposal for a State-of-the-Knowledge Report on African Rattans. Kew, UK: Royal Botanic Gardens, the African Rattan Research Programme. 8 p.

Keywords: Cameroon/Limbe/proposal/rattan/research

Web/URL's: *afirrattan@aol.com*

Abstract: "The CARPE-funded NTFP workshop held in Limbe in May 1998 highlighted the need for further study of a number of high value and much utilized NTFP's. In order to complete gaps in existing knowledge as well as to provide an overview of the current understanding of these crucial taxa, reports on those species selected have been commissioned. The African Rattan Research Program (ARRP) and PAFT-Gabon have been invited to submit a proposal for a state-of-the-knowledge report on African rattans. It is proposed that this report is undertaken through the presentation of papers presented at a workshop, again to be held in Limbe, Cameroon, where those currently working on rattans can present their work. The resulting formal publication will be edited by Terry Sunderland and Jean-Pierre Profizi and will provide the state-of-the-knowledge report required by CARPE."

Notes: This is a 3-month, \$9,000 proposal submitted to the USAID/CARPE.

Sunderland, T. and Tchouto, P. 1999. A Participatory Survey and Inventory of Timber and Non-Timber Forest Products of the Mokoko River Forest Reserve, SW Province, Cameroon. Kew, UK: IR1/CARPE. Royal Botanic Gardens; African Rattan Research Programme. 42 p.

Keywords: Cameroon/community forest/conservation/domestication/exploitation/forest management/inventory/monitoring/population structure

Abstract: "Recent legislation in Cameroon, now means that forest-based communities can, with technical support from the state, manage and legally take control of their own forest resources. The development of pilot community forest area, however, has been hindered by a lack of field-based efforts to implement appropriate methodologies for the development of suitable management plans that allow for community-based management of forest resources. While the need for participatory resource surveys and inventories has been highlighted, there are few examples nor indeed an established protocol that allows these to take place. Recent work by CARPE has highlighted the potential of

nontimber forest products to contribute to conservation and development initiatives, especially when managed in conjunction with timber resources; there is no exclusivity to forest management, many species have a wide range of often over-lapping uses. This work presents the results of a participatory survey and inventory undertaken in the Mokoko River Forest Reserve, in collaboration with the Mount Cameroon Project, the first of three such studies to be undertaken by IR1/CARPE in Cameroon.

“Based on a rapid ethnobotanical survey, key timber and nontimber forest resources were identified and enumerated in two key sites. While essentially a methodology-testing exercise, enough data was gathered to determine the effects of current exploitation levels and a population structure of each taxa. Based on these data, rough estimates regarding the potential harvest of these key resources are proposed. Recommendations for domestication and/or better management are also outlined. This work could also form the baseline from which an integrated community-based ecological monitoring program could be established.”

Sunderland, T.; Njiamnshi, A.; Koufani, A.; Ngo-Mpeck, M.; Obama, C. 1997. The Ethnobotany, Ecology and Natural Distribution of Yohimbe (*Pausinystalia johimbe* (K. Schum.) Pierre ex Bielle), an Evaluation of the Sustainability of Current Bark Harvesting Practices, and Recommendations for Domestication and Management. Report for the International Council for Research in Agroforestry (ICRAF); Nairobi: ICRAF. 31 p.

Keywords: Cameroon/domestication/ecology/Equatorial Guinea/ethnobotany/market/markets/medicinal/overexploitation/*Pausinystalia johimbe*/pharmaceutical/research/sustainability/*Pausinystalia*

Abstract: “*Pausinystalia johimbe* (K. Schum.) Pierre ex Bielle, is a widely used medicinal plant used to treat male organic impotence that is exploited in large quantities for both export and local medicinal plant markets. Concerned over the fact that future supplies might be compromised by current levels of overexploitation, Boehringer Ingelheim, a German pharmaceutical company who imports *P. johimbe* bark directly from Cameroon through Plantecam (a subsidiary of Laboratories Fournier) was commissioned by ICRAF to undertake a pilot study on the ethnobotany, ecology, and natural distribution of the species and to assess the effects of current harvesting practices. The results of this study are recounted in this report. Further information was gathered with a view to include the species as part of ICRAF’s domestication program for use in agroforestry systems.”

Sunderland, T.; Nkefor, J.; and Blackmore, P. 1998. The Establishment and Maintenance of a Silvicultural Trial of *Laccosperma secundiflorum* in Cameroon. Interim Progress Report for the Central African Regional Programme for the Environment (CARPE) and the United States Forest Service Office for International Programs. Kew, UK: Royal Botanic Gardens, African Rattan Research Programme. 4 p.

Keywords: Cameroon/domestication/*Laccosperma secundiflorum*/monitoring/rattan/yield/growth/*Laccosperma*

Notes: This paper describes the initial stages of domestication of one of the most important rattan species in Central Africa. Appended to the paper are notes on monitoring growth, sample recording sheets, and the outcome of early monitoring exercises.

Takeda, J. and Sato, H. 1993. Multiple Subsistence Strategies and Protein Resources of Horticulturalists in the Zaire Basin: The Ngandu and the Boyela. In: *Tropical Forests, People, and Food: Biocultural Interactions and Applications to Development*. Hladik, C.M.; Hladik, A.; Linares, O.F.; Pagezy, H.; Semple, A.; and Hadley, M., eds., *Man and the Biosphere Series*. Paris: UNESCO. 13: 1-8.

Keywords: food/hunting/Zaire/slash and burn

Abstract: Excerpted from the Introduction: "The Ngandu and the Boyela are two subgroups of the Mongo, inhabiting the central part of the Zaire basin (Van der Kerken, 1944). They practice slash-and-burn horticulture and engage in the complementary subsistence activities of hunting, gathering, fishing and livestock raising, discussed in the Ngandu case study below. Both depend on cassava tubers grown in their fields for the bulk of their daily food. Whereas cassava tubers represent an excellent means of storing starch, they are extremely poor in terms of protein content (see McKey and Beckerman, 1993, this volume). Therefore, these groups have to pay particular attention to securing other protein-rich foods, as discussed in the Boyela case study."

Tan, L.C.; Ruiz Pérez, M.; and Ibach, M. 1996. Non-Timber Forest Product Databases. Jakarta: CIFOR. 94 p.

Keywords: data base/website

Web/URL's: http://www.cgiar.org/cifor/publications/publications_list.html

Notes: Databases with abundant NTFP information exist. This report

describes a survey of these databases. Included are profiles of eight data bases. It is listed as a “special publication” on the website indicated.

Tchamou, N. and Bigombe, P. 1999. Forum sur les Systèmes Locaux de Gestion des Ressources Forestières: Experience de la Composante IR1/Theme 4, CARPE; Yaoundé, Cameroun. Washington, DC: USAID/CARPE. (30-31 Aout, 1999.)

Keywords: Cameroun/domestication/valorisation

Abstract: Excerpted from the Introduction: “L’objectif général du Forum était de procéder à la restitution et à l’analyse des premiers résultats de l’étude sur les systèmes locaux de gestion des ressources forestières (SLGRF), d’en capitaliser les acquis et de dégager les axes d’action stratégiques du Program pour les prochaines années.

1.2. Objectifs Spécifiques

Le Forum visait deux (2) objectifs spécifiques, eux-mêmes liés aux objectifs de la composante, à savoir:

Appréhender la vitalité et la fonctionnalité des systèmes locaux de gestion des ressources forestières;

Identifier les types d’incitations nécessaires à mobiliser pour rendre ces systèmes beaucoup plus efficaces.

Par rapport à ces objectifs, les préoccupations fondamentales du Program s’inscrivent autour de trois (03) thématiques:

la cartographie participative à grande échelle;

la valorisation des produits forestiers non ligneux;

la gouvernance locale des ressources forestières.

Le déroulement du Forum a permis d’aborder les questions liées à ces préoccupations.”

Tchatat, M. 1999. Produits Forestiers autre que le Bois d’Oeuvre (PFAB): Place dans l’Aménagement Durable des Forêts Denses Humides d’Afrique Centrale. Rapport Provisoire. Cameroon, CIRAD-Forêts and CIFOR. 84 p.

Keywords: aménagement durable/Cameroun/Congo/Gabon/Guinée Equatoriale/RCA/durabilité/RDC

Abstract: Excerpted from the Introduction: “Elle a pour objectif global de présenter une synthèse sur les PFAB et leur rôle dans l’aménagement durable des forêts du Bassin du Congo. La durabilité est analysée

doublement sous l'angle écologique et socio-économique. Les objectifs spécifiques détaillés tels que définis par les termes de référence sont présentés en annexe.

Cette étude concerne l'Afrique Centrale "humide" que nous assimilerons improprement au Bassin du Congo. Il s'agit en fait non seulement des pays arrosés par le Congo et ses affluents, mais aussi ceux arrosés par l'Ogooué, la Sanag et leurs affluents, soit six pays: Cameroun, Centrafrique (RCA), Congo Brazzaville, Congo Démocratique (RDC), Gabon, Guinée Equatoriale."

Notes: This report includes 12 pages of references.

Tchatat, M. and Ndoye, O. 1999. Produits Forestiers Autres que le Bois d'Oeuvre (PFAB) et Aménagement Durable des Forêts du Bassin du Congo: Etat des Lieux. Paper presented at Séminaire FORAFRI de Libreville - Session 3 Produits de la Forêt, 1999, at Libreville, Gabon. 18 p.

Keywords: aménagement durable/Congo/crise économique/dynamique forestière/dévaluation/exploitation/frugivorie/Gabon/Guinée Equatoriale/pollinisation/RCA/rurale/fruits

Abstract: Les forêts du Bassin du Congo sont des écosystèmes extrêmement importants tant du point de vue écologique que socio-économique, en particulier pour les populations riveraines et urbaines. La présente étude tend à montrer que les PFAB sont devenus une source de revenus et d'emplois pour les populations rurales et une catégorie de populations urbaines, surtout depuis la crise économique de 1986 et la dévaluation du Franc CFA qui a suivi en 1994. Ceci a entraîné une exploitation commerciale le plus souvent non durable de ces ressources.

En outre, les essais et travaux d'aménagement qui ont eu lieu dans la région n'ont tenu compte ni des PFAB, ni des populations riveraines. Pourtant, il ressort clairement que les animaux sauvages (PFAB d'origine animale) en se nourrissant du nectar des fleurs des fruitiers de ces forêts ou de leurs fruits (PFAB d'origine végétale), entretiennent et maintiennent la dynamique forestière à travers la pollinisation, la frugivorie et la dispersion des diaspores. De même, un aménagement qui prend en compte les PFAB a plus de chance de rencontrer l'adhésion des populations riveraines et donc d'être plus effectif. On peut donc dire que les PFAB jouent et peuvent jouer davantage un rôle important dans l'aménagement des forêts du Bassin du Congo.

Notes: Publication date is estimated.

Tchotsoua, M. and Mapongmetsem, P.M. 1998. Le Safoutier (*Dacryodes edulis*): Zones Écologiques et Commercialization des Fruits au Cameroun. In: *Proceedings of 2nd International Workshop on African Pear Improvement and Other New Sources of Vegetable Oils*. Kapseu, C and Kayem, G.J., eds. Yaoundé, Cameroun: Presses Universitaires de Yaoundé

Keywords: alimentaires/Cameroun/Cameroun/commercialization/conservation/Dacryodes/filière/production/Safoutier/fruits/valorisation/Dacryodes edulis

Abstract: *Dacryodes edulis* est un oléagineux dont les fruits sont consommés presque partout au Cameroun. Depuis plus d'une décennie, on constate un regain d'attention sur les études en vue de la valorisation économique de sa filière. Cependant, la zone écologique du Safoutier n'est pas encore cernée au Cameroun, la production nationale n'est pas encore quantifiée. Dans cette note, les auteurs en essayant de répondre à ces préoccupations sont arrivés à la conclusion selon laquelle, les paramètres pédoclimatiques, les habitudes alimentaires et la sédentarisation précaire de certaines populations déterminent la présence de cette espèce. Ces paramètres leur ont permis d'élaborer une carte des aires de production du safou au Cameroun. La production annuelle, qui entre dans le circuit de commercialization à partir des principaux secteurs de production est évaluée à 118 603 tonnes brutes ; soit 86 858 tonnes pour la première aire (région allant de Nkongsamba à Ebolowa en passant par Makénéné et Yaoundé), 31 391 tonnes pour la deuxième (province de l'Ouest et une partie des provinces du Sud-Ouest, du Nord Ouest et du Centre) et 354 tonnes pour la troisième (zone côtière, provinces de l'Est et de l'Adamaoua). Cependant, moins de 100 000 tonnes brutes bouclent le cycle de commercialization à cause du système impliquant de nombreux intermédiaires (producteurs, grossistes, détaillants), des techniques et des infrastructures de conservation et de commercialization peu adaptées.

The Rainforest Alliance website. Hosted by The Rainforest Alliance.

Web/URL's: <http://www.rainforest-alliance.org/>

Contact/Web Master: canopy@ra.org

Keywords: business/conservation/website/research

Abstract: Excerpted from About Us: "The Rainforest Alliance is an international nonprofit organization dedicated to the conservation of tropical forests for the benefit of the global community. Our mission is to develop and promote economically viable and socially desirable alternatives to the destruction of this endangered, biologically diverse

natural resource. We pursue this mission through education, research in the social and natural sciences, and the establishment of cooperative partnerships with businesses, governments, and local peoples.”

Notes: This website contains a link to *The Canopy* an on-line publication of The Rainforest Alliance as well as news of the Alliance’s conservation programs.

The Taxonomy, Ecology and Ethnobotany of African Rattans. Research Proposal Submitted to the Kew Foundation. 1998. 17 p.

Keywords: Cameroon/ecology/ethnobotany/proposal/rattan/research/taxonomy

Notes: This is a 2-year, \$60,000 proposal to assess the role West African rattans play in the local economy and to assess the cultivation and silvicultural potential for the sustainable development of rattans in agroforestry systems for the optimization of their usage. The document includes five pages of references.

The Taxonomy, Ecology and Utilisation of African Rattans. 1998. A Joint Royal Botanic Gardens, Kew, UK: University College, London; University of Buea; and Limbe Botanic Garden Collaborative Research Program. 17 p.

Keywords: Cameroon/ecology/proposal/rattan/research/taxonomy

Notes: This is a 3-year, \$300,000 project proposal. It provides a good overview of rattan and the justification for studying this species.

Towards a Strategy for Clonal Forestry: Some Guidelines Based on Experience with Tropical Trees. 1992. Midlothian, Scotland, UK: Institute of Terrestrial Ecology. 16 p.

Keywords: research/deforestation/rural/propagation/collection/production

Abstract: “This paper considers a strategy for clonal forestry/ agroforestry, based on the Institute of Terrestrial Ecology’s (ITE) research projects in both the moist forests of West Africa and Central America and the dry woodlands of East Africa. The suggested strategy assumes the need to produce commercial timber for export, but also takes into account the need to (a) counteract further deforestation by encouraging the restoration of degraded land, (b) provide the domestic needs of rural people, (c) develop sustainable systems of forestry and agroforestry, and (d) conserve genetic resources.

“In producing guidelines towards formulating this strategy the paper considers options which should be taken into account at the following steps in the development of clonal technologies.

The strategy being pursued by ITE in the tropics is to:

- i) Use low-tech approaches to gain experience with the propagation, start the clonal selection program, and avoid need for foreign capital.
- ii) Use easy-to-handle juvenile tissues.
- iii) Improve physiological understanding of the rooting process.
- iv) Establish and maintain a gene bank by continuous collection of genetic diversity.
- v) Develop simple, low-cost methods of screening populations at an early age for superior individuals.
- vi) Utilize existing genetic variation in wild populations; at a later date, breeding and/or biotechnology can introduce new variations.
- vii) Ensure a regular turnover of selected clones.
- viii) Develop a clonal silviculture to maximize production and minimize risks.”

Notes: Publication date is estimated.

Townson, I. 1992. Exhaustion, Abandonment, and Sustainability Re Dynamics of Forest Product Use in West Africa, with Particular Reference to the Export Trade. UK: Oxford Forestry Institute, University of Oxford, 74 p. Thesis.

Keywords: Cameroon/collection/dynamics/historical/income/international trade/marketing/policy/processing/sustainability/trade

Abstract: “This work analyses the historical evidence relating to the use of nontimber forest products in West Africa. The period examined concludes with the granting of independence—for the majority of the countries this occurred in the late 1950’s—60’s. Extensive use is made of original documents (both published and unpublished), including descriptions, accounts and official records and reports. Recent literature relating to the subject has also been consulted.

“Descriptions of products for subsistence use and in local trade are given, with comments and analysis on their importance including any apparent changes in their use. However, the majority of the work is concerned with the international trade in these forest products. Such

exchanges began in the Arab period (900 A.D. - 1800 A.D.) and expanded rapidly following European discovery of the area. Extensive changes in forest use occurred, with trade not only providing income but also affecting social and political systems. European colonization dramatically speeded up this process both as a result of increased intensity of exchange and the introduction of government policies related, both directly and indirectly, to the use of forest resources. These latter included the establishment of forest departments and formalized systems for the management of forests.

“The consequences of these influences on the deliberate cultivation and collection of forest products are examined. Additionally, different trends relating to the processing and marketing can be identified using specific case studies as examples. These may have had an important effect on patterns of consumption.

“In conclusion, the general trends and themes that occurred during this time are presented, and the relevance of this information to present-day problems is discussed. Recent attempts at commercial development by governments and agencies have been queried due to increasing doubts over the feasibility, sustainability, and desirability of dependence on nontimber forest products.”

Notes: This thesis defines “West Africa” as extending into the western edge of Cameroon. The historical treatment of the NTFP sector provided by this paper is unique.

Townson, I. 1995. Incomes from Non-Timber Forest Products: Patterns of Enterprise Activity in the Forest Zone of Southern Ghana. Main Report. Forestry Research Program, ODA. 94 p.

Keywords: demand/enterprises/entrepreneur/Ghana/household/income/income-generating/location/markets/growth

Abstract: Excerpted from the Executive Summary: “This report summarises the results of a survey of income-generating activities based on nontimber forest products in the forest zone of Ghana. Nontimber forest products were defined as those products for which the principal raw material can be derived from forests. The study was conducted over a six-week period in August-September 1994; 4,308 households were visited and 2,899 individual income-generating activities were identified. Detailed questionnaires were administered to the proprietors of 955 of the activities.

“The primary objectives of the study were to provide information on the magnitude, composition, location, use of raw materials, and other characteristics of NTFP-based enterprises, and on characteristics of those involved in these activities and to identify growth patterns, problems, and constraints.”

Notes: A well-developed discussion that includes the “magnitude and location of activities,” “industry sector and firm characteristics,” “entrepreneur characteristics,” “raw materials,” “markets and demand,” “dynamics of enterprises and constraints to growth,” and “policy implications.”

Townson, I. 1995. Forest Products and Household Incomes: A Review and Annotated Bibliography; Tropical Forestry Papers. UK: Oxford Forestry Institute, Oxford University. 214 p.

Keywords: bibliography/food/household/household income/income/website/fuelwood/basketry

Web/URL's: <http://www.plants.ox.ac.uk/ofi/pubs/tfpapers.htm>

Notes: This is a very comprehensive document that looks at fuelwood and charcoal, forest foods, basketry and handicrafts, extractive products, furniture, and carpentry. Under each of these subtopics the author provides a brief heavily referenced review and a bibliography with extensive annotation. It is global in scope and the publication date is estimated. Information on purchasing the document can be found on the website indicated.

Trefon, T. 1994. City Dwellers and the Central African Tropical Forest: Resource Use and Perceptions. Brussels, Belgium: European Commission DG XI.

Keywords: Cameroon/Zaire/Gabon/research/urban/conservation/deforestation/economic/historical/economic crisis/devaluation/hunting/commerce/food/ecotourism/policy/commercialization/anthropology/fuelwood

Web/URL's: <http://lucy.ukc.ac.uk/Rainforest/trefon/contents.html>

Abstract: “In September 1993, the DG XI of the European Union contracted the Centre of Cultural Anthropology at the Université Libre de Bruxelles to carry out a feasibility study on “City Dwellers and the Central African Tropical Forest: Resource Use and Perceptions.” This final report is based on a country-comparative, interdisciplinary, social-scientific approach that includes, most notably, research findings; steps taken with respect to accumulating relevant documentation, gathering

data, and creating a research network; and recommendations for further concrete actions and study. The long-term objective behind this study is to identify problem areas in the forest conservation field and to address them by stimulating public concern and finding new ways of thinking, as well as offering alternatives to certain forest products consumed in the cities.

“There is a compelling urgency to devote research funds and efforts to this subject because there is unanimity among experts from all disciplines that the forest crisis is escalating. If deforestation and species depletion continues at the present rate, the future of our environment as we know it will be compromised. Efforts must be taken to understand in more precise terms the socio-economic articulations and interstices between the forest-city interface. This will contribute to the effort in slowing down this escalation which so powerfully influences contemporary African history.

3.1 RESEARCH IMPERATIVES

Numerous actions have been initiated aimed at halting the ecological and human disaster threatening the tropical forest in Central Africa and its indigenous peoples. A crucial factor, however, has yet to be adequately developed: the forest-city interface. This term, repeated frequently throughout this study, is defined loosely as being:

How forest resources are used by city dwellers.

How the forest, its peoples, products, related activities, and symbolism are perceived by urban populations.

“Understanding the socio-economic factors accounting for why, and for what specific purposes, forest products are consumed in cities, this needs to be supported by socio-anthropological research. It is crucial to identify how city dwellers perceive the forest in anthropological terms because perceptions are intricately linked with use, which in turn can lead to unsustainable development and eventual resource depletion. Grasping local perceptions and sensibilities, moreover, will improve working relations with African administrations, organisations, and NGO’s involved in addressing conservation issues.

“Anthropologists, economists, political scientists, and other social scientific researchers are called upon to play active roles in interpreting the crux of the forest-city interface. African and European social scientists from these disciplines must work toward conservation by integrating local leaders into the conservation struggle, by stimulating

public awareness, and by organizing educational efforts. It is absolutely necessary to emphasize the cultural, political, and economic aspects of urban pressure on the forest environment.

“Despite certain common denominators, the nature of the forest-city interface varies from one country to another depending on political systems, economic structures, geographical and historical influences, cultural attachments, demography etc. A study of this interface must, therefore, be country-comparative before being able to assert research findings. Hence the selection of three very different countries in Central Africa for initial research; that is Cameroon, Gabon, and Zaire. (Reasons for this selection stated below in section 5.2.)

3.2 WORKING HYPOTHESES

“The future of the forest depends to a very large extent on city dwellers. This applies to the elite because political decision-makers, representatives of multinationals or foreign companies, local businessmen, among others, determine through legislation, political accommodation, and commercial criteria the ways in which forest resources are exploited.

“It also applies to the masses: millions of people in the swelling cities of Central Africa use and rely on, discover and rediscover forest resources to help cope with the exigencies of daily survival which is exacerbated by the current economic crisis: weak economies and recession in general, CFA franc devaluation in Cameroon and Gabon, and political and economic deterioration in Zaire.

“In times of economic hardship, urban populations exert increasing pressure on forest resources, generally in ways that ignore “sustainable development.” Deforestation takes place to provide fuel wood and for the establishment of plantations. Likewise, urban unemployed take to commercial hunting as a means of earning a livelihood. This dramatically reduces wildlife. It also disrupts traditional living habits in the forest environment, changing attitudes, and behaviors.

“Forest conservation or management (this latter being a difficult and polemic term to define) must take a wide array of social science factors into account to be realistic. The world economy, demographic questions, urbanization, ethnicity, the psychological lure of the city, and so forth are among the subjects which influence the ways and degree forest resources are exploited.

“Deforestation and resource depletion by city dwellers goes far beyond the commonly stated reasons of “poverty and ignorance”: cultural and traditional attachment to forest products is deep-rooted and enduring. “The forest is perceived by city dwellers in a multiplicity of ways which merit in-depth research attention. Some consider the forest to be a vast reservoir of resources to be consumed and not managed; others are apprehensive, given real and imagined dangers; and others feel a deep spiritual attachment to it. The vast majority of city dwellers are indifferent to the forest as defined and defended by Europeans.

“Notwithstanding the physical departure from the forest habitat, the forest remains important to urbanites for a variety of reasons. The reasons range from spirituality, ritual, legends, and nostalgia to commerce, traditional healthcare, food, and fuelwood purveyance.

“The fragile nature of African political systems has induced local leaders to address priorities that serve incumbency above all else. These priorities are generally linked to perceived economic requirements or commercial activities which provide revenues at minimal investment costs. With respect to the forest, this translates, on the international level, into massive lumbering; sale of live animals for research, zoos, or pets; and hunting parties or ecotourism for the well-to-do. Likewise, policy concerning nonsustainable use of forest products by urban populations, also for reasons of expediency, is characterized by attitudes ranging from indifference to leniency. Short-term political and economic imperatives, in sum, clash with forest conservation which is a long-term enterprise.

“A better understanding of the forest-city interface could have an impact on development issues themselves. Transportation networks; urban planning; cultivation, gathering, and commercialization of agricultural and forest products; the vast timber sector; animal husbandry; hunting and fishing; etc. are all development issues but they are also issues intricately linked to the development process.

“The way forest conservation evolves in the near future will have a direct impact on the availability of certain resources in urban areas. Deterioration of living standards in African cities to even worse poverty levels will exacerbate the flow of “genuine” and “economic” refugees from Africa into Europe.”

TROPICS Tropical Forestry Projects Information System website.
Hosted by OneWorld, Oxon, United Kingdom.

Web/URL's: <http://www.oneworld.org/tropics>

Contact/Web Master: tropics@odi.org.uk

Keywords: website/policy/research/forest cover

Abstract: "TROPICS provides essential infrastructure to improve effectiveness and coordination of tropical forestry aid, leading ultimately to enhanced complementarity and coherence in the sector. It does this by bringing together information about tropical forestry activities undertaken by the European Commission and European Union member states. "TROPICS works by connecting together many existing sources and types of information, allowing them to be shared more effectively within and between agencies. These include data from internal management systems, project cycle management documents, websites, publications, and maps.

"By making these materials more readily accessible, it is possible to enable policy and project staff to quickly find the information they need; improve the collective institutional memory of past activities; provide a clear, unified overview of European activities in the sector; and add value to work already done by avoiding duplication of effort and *inter alia* reuse existing information sources wherever possible, to minimize long-term costs of maintenance.

"TROPICS presently covers 1,643 tropical forestry activities, including: 672 activities funded by the European Commission; 579 activities funded by Department for International Development - UK (DFID); 108 activities funded by Deutsche Gesellschaft für Technische Zusammenarbeit - Germany (GTZ); 22 activities undertaken by CIRAD-Forêt (France); 6 activities undertaken by Department for International Development Co-operation- Finland (DIDC); 239 Dutch research projects identified by Tropenbos information from Finland, France, and the Netherlands expected by Spring 2000; all 22 chapters of the EC/ODI 'EU Tropical Forestry Sourcebook' (1998) (Adobe Acrobat PDF files; English and French language versions); UNDP/IFF3 survey of International Forestry Aid Flows (1999) (Adobe Acrobat PDF file); 601 links to country information on other sites (UNDP, FAO, Agenda21 etc.); 26 links to project websites; and 43 country forest cover GIS maps from WCMC and JRC-TREES."

Note: The TROPICS Final Report (December 1999) is available in PDF format.

Tsague, A. 1995. Etude de la Filière des Produits de Cueillette du Prélèvement à la Première Commercialization. Douala, Cameroon, Projet API de Dimako. 39 p.

Keywords: Cameroon/Cameroun/commercialization/domestication/exploitation/filière/Gnetum/research/Vegetative Propagation/chasseur/rurale

Abstract: From the Introduction: “La zone tropicale humide se caractérise par une diversité biologique incomparable. Cependant, certaines de ces ressources naturelles sont soumises à des prélèvements dont la fréquence et le volume peuvent dans certains cas avoir des conséquences sur leur pérennité. Les principaux acteurs impliqués dans ce prélèvement sont les exploitants forestiers, les chasseurs, les cueilleurs et les pêcheurs, notamment les populations locales.

Les trois derniers acteurs sont principalement représentés par les populations rurales résidant dans la zone forestière. Celles-ci exercent des prélèvements réguliers ou saisonniers sur ces ressources sans que l’on puisse en apprécier l’effet sur leur renouvellement.

La présente étude a pour objectif de déterminer l’importance de ces produits dans les ménages de l’Est du Cameroun, et d’identifier les contraintes liées à l’exploitation de cette ressource afin d’envisager un éventuel développement de cette activité. Puis elle permettra également de prendre en considération les droits d’usage des populations dans le processus d’aménagement.”

Notes: This report includes 13 pages of annexes that include a list of species with useful information, and tables showing amounts of a given NTFP harvested, consumed, given away, and sold for each study group.

Tshiamala-Tshibangu, N.; Essimbi, E.P.; and Ndjigba, J.D. 1997. Utilization of the Non-Wood Forest Products in Cameroon. Case of the Korup Project. *Nature et Faune/Wildlife and Nature*. 13(2): 3-20.

Keywords: Cameroon/food/market/medicine/production

Abstract: “This article proposes to list those plant-based NWFP’s that are harvested for personal use or for the local or foreign market needs by people living within or around intervention zones covered by the Korup Forestry Project established in Cameroon. There are 33 plant species from 21 families. The scientific and common names of each of these is given along with brief information on the plants’ use for food, medicine, and other uses. Conclusions include confirming that Korup forest is characterized by a diversity of available and utilized plant species, and

that current harvesting techniques are detrimental to the sustained production of NTFP's."

Notes: This is a bilingual French/English publication put out by the UNEP/FAO.

U.S. Department of Agriculture, Forest Service. 1996. NWFP's/NTFP's in Central Africa: An Incomplete Bibliography. Washington, DC: U.S. Department of Agriculture, Forest Service. 14 p.

Keywords: bibliography

Notes: This is an uncredited listing of references.

van Andel, T. 1995. Non-Timber Forest Products of the North-West District and the Pomeroon area of Guyana. Tropenbos project nr. 1.1.4. Herbarium Division. Tropenbos, Guyana: Utrecht University, Draft Workplan. 16 p.

Keywords: exploitation/Guyana/inventory/processing/research/work plan/website

Web/URL's: <http://www.tropenbos.nl/tropenbos/tropenbos-home.html>

Abstract: Excerpted from the Abstract: "Objectives 1. To make a complete inventory of the plants used for the extraction of NTFP. 2. To obtain insight in the purposes for which the NTFP are used. 3. To study the harvesting and processing methods by local communities. 4. To understand the role of these plants in the local economy. 5. To compare the above mentioned data for the different research sites."

Notes: Described by a reviewer as "One of the best projects on NTFP I've seen in a long time." This report includes a literature review section and work calendar. The report can be ordered through the Guyana Program at the website indicated.

van der Linde, H. and van Adrichem, E. 1997. Non-Timber Forest Products from the Tropical Forests of Africa. A Bibliography. Amsterdam, Holland: IUCN. 60 p.

Keywords: bibliography/search/website

Web/URL's: <http://iucn.org/bookstore/index.html>

Notes: This document provides hundreds of annotated references. It is divided into those relevant to Africa, to specific countries, and to NTFP's in general. It can be ordered via a search on the website indicated.

Van der Linden, P. 1994. Valorisation des Produits Forestiers Végétaux Secondaires dans la Réserve de Faune du Dja (Est Cameroun). Ingénieur Agronomie, Section Interfacultaire d'Agronomie. Brussels, Belgium: Université Libre de Bruxelles. 82 p.

Keywords: Cameroon/chasse/food/inventory/*Irvingia*/markets/production/research/régénération/*Ricinodendron huegelotii*/*Tetrapleural* agricole/valorisation

Abstract: La valorisation des produits forestiers végétaux secondaires, de la Réserve de Faune du Dja, présente une alternative intéressante à la chasse commerciale.

Ce travail montre que cette valorisation peut s'intégrer au sein du système agroforestier villageois suivant quelques aménagements.

Parmi les fruitiers forestiers, les espèces condimentaires présentent quelques problèmes de régénération à proximité du village. Ces espèces se révèlent être les plus prometteuses au niveau commercial comparées aux espèces fruitières de bouche.

La quantification de la production fruitière du *Tetra pleura tetraptera* a mis en évidence les relations entre celle-ci et le diamètre de l'arbre. Les plus gros arbres fournissent la plus grosse production.

Ce travail montre également que les superficies du terroir fonder sont encore suffisantes pour soutenir l'agriculture itinérante sur brulis. Les productions agricoles sont faibles mais suffisent à remplir leur but premier, à savoir l'alimentation familiale.

Notes: In addition to the body of the thesis, this document contains 132 pages of annexes.

Van der Put, I. 1990. A Marketing Plan for Cola Nuts, a Minor Forest Product of the Tai National Park, Côte d'Ivoire. The Netherlands: Agricultural University Wageningen. 60 p.

Keywords: buffer zone/Cola/cola nuts/Côte d'Ivoire/economic/Ivory Coast/marketing/national park

Notes: Van der Put investigates the sustainable economic use of cola nuts as an element in the management of a buffer zone around the Tai National Park. His conclusions are limited by a lack of "essential information."

Van Dijk, H. 1994. Inventory of the Names and Functions of Non-Timber Forest Product Species. Intermediate Report within the framework of project S1: Economic and Ecological Assessment of Non-Timber Forest Products in the Bipindi-Akom II Region, Cameroon. Kribi, Cameroon: Tropenbos, Cameroon Program. 62 p.

Keywords: Cameroon/commercialization/economic/inventory/logging/market survey

Abstract: From the introduction: "This report presents the results of this baseline survey, which was carried out during a three month period. It consists of all the data on the names and uses of the NTFP species which were mentioned to be used and which could be identified."

Notes: The report contains abundant data and appendices.

Van Dijk, H. 1995. Assessment of the Abundance and Distribution of Non-Timber Forest Product Species. Intermediate Report within the framework of project S1b: Economic and ecological assessment of Non-Timber Forest Products in the Bipindi-Akom II Region. Kribi, Cameroon: Tropenbos, Cameroon Program. 22 p.

Keywords: economic/exploitation/inventory/population structure/research/spatial variation

Notes: This is a research report that discusses the methodology used to inventory the NTFP's in the test area. The report provides "early indications" of the impact of exploitation on some species and explains how the research needs to be continued for more conclusive results. There is a short bibliography and an extensive set of appendices.

Van Dijk, J.F.W. 1997. Assessment of Non-Timber Forest Products Resources in View of the Development of Sustainable Commercial Extraction. The Netherlands: Department of Forestry, Wageningen Agricultural University. 13 p.

Keywords: Aframomum/Cameroon/conservation/domestication/exploitation/Garcinia/income/Irvingia/market/markets/medicinal/palm wine/Panda oleosa/Poga oleosa/production/Ricinodendron/trade/bush mango/Panda/Poga/toxisperma/Baillonella toxisperma/Irvingia gabonensis

Abstract: "The development of commercial NTFP extraction is often seen as an option to increase the income of people living in the forest and to enhance forest conservation. For the development of NTFP extraction, the most promising products are those that can be exploited in a sustainable way and which have a high yielding resource base.

“Within the framework of the Tropenbos Cameroon Program (TCP) socio-economic and ecological surveys on NTFP’s are being carried out in the Bipindi-Akom II region in the south province of Cameroon. In this region, the extraction of NTFP for markets is not very well developed. Income from NTFP is very important, but it is mainly generated by selling products such as bush meat and palm wine for which the trade is restricted to the village level only. A survey on NTFP resources was carried out in order to gain insight into the abundance and distribution of NTFP species and to get indications of the impact of exploitation on the available resources.

“It appeared that even in a relatively small area of 200,000 ha, the variation in abundance and distribution is high. Several frequently used species are restricted to specific parts of the area. An important number of the (potentially) commercial NTFP species find their maximum density in secondary forest types. Examples are the condiments “njansang” from *Ricinodendron heudelotii* and “mbongo” which comes from the herb *Aframomum citratum*.

“Many of the species providing products with a commercial value, such as a number of oleaginous nuts producing trees as *Baillonella toxisperma*, *Panda oleosa* and *Poga oleosa*, appeared to be rare. Other important NTFP species, like the well known bush mango tree *Irvingia gabonensis*, are or not very abundant.

“One of the exceptions in this respect, is *Garcinia lucida* from which the bark and the nuts are used for palm wine production as well as for medicinal purposes. This small understorey tree grows on steep slopes in high density stands over areas of 2 to 3 km². However, in areas where the bark is exploited for commercial purposes, the mortality is very high and these populations are, therefore, seriously threatened by depletion.

“In conclusion, the compatibility of raising income from NTFP extraction and enhancing forest conservation is not very evident. Not only because of the risks of destructive harvesting practices, but also because of the low densities of many NTFP species in natural forest. The intensification of the management of anthropogenic land types and the domestication of NTFP species might be the most promising options.”

Notes: The publication date is estimated. Appendices consist of a descriptive listing of “commercialized and commerciable” species in the study area, and a short discussion of “influences on successful community-based natural resources management.”

van Dijk, J.F.W. 1999. Non-Timber Forest Products in the Bpindi-Akom II Region, Cameroon: A socio-economic and ecological assessment. The Tropenbos-Cameroon Program. 197 p.

Keywords: Cameroon/commercialization/exploitation/food/household/logging/medicine/population structure/research/website

Web/URL's: <http://www.tropenbos.nl/tropenbos/tropenbos-home.html>

Abstract: Excerpted from the Abstract: "The book starts with a general outline of the NTFP study. In addition, a description of the area is given, with a special emphasis on those aspects which are of importance for the ecological and socio-economic aspects of NTFP extraction.

"The second part deals with the uses of NTFP species in the area. They were classified in food plants, animal resources, forest medicines, construction materials and household equipment. The uses of the most important NTFP species are described in detail. A complete presentation of the uses is included in the appendices. In addition, the people's opinion on the most important NTFP resources, their availability and management is described, and the commercialization of NTFP's in the area.

"The third part reflects the results of the overall ecological assessment. Based on the differences in species richness and diversity, as well as the distribution patterns of individual NTFP species, the major habitat types were identified. The abundance of NTFP species was related to these major habitat types. The impact of exploitation, especially logging and harvesting of NTFP's on the population structure was examined for a restricted number of species.

"Parts two and three of the book are concluded by syntheses of the results and conclusions, referring to management issues and implications for further research."

Notes: This book can be ordered from the website indicated.

van Dorp, M.; Niemeijer, R.; and Offermans, D. 1998. The Wealth of Forests: A Methodology for Socio-Economic Valuation of Non-Timber Forest Products on a National Scale. Volume 1: Methodology. Amsterdam: AIDEnvironment. 37 p.

Keywords: economic/research/valuation

Web/URL's: aidenvir@antenna.nl

Notes: This report provides a good overview of an approach to placing an economic value on NTFP's in a given locality. Also provided are listings of institutions involved in, and methodologies used for, NTFP research.

van Dorp, M.; Niemeijer, R.; and Offermans, D. 1998. The Wealth of Forests: A Methodology for Socio-Economic Valuation of Non-Timber Forest Products on a National Scale. Technical Protocol. Amsterdam: AIDEnvironment. (2): 27.

Keywords: valuation

Web/URL's: aidenvir@antenna.nl

Notes: This is the companion volume to "The Wealth of Forests: Volume 1: Methodology" by the same authors. It "presents an overview of all the activities needed to obtain a reliable and valid estimate of the contribution of NTFP to the national or regional economy. It also describes the documents and other outputs to be generated in the course of these activities." The chapters provide a description of each phase, an example application of the protocol, and an explanation of sampling issues and reliability.

van Essche, K. 1993. Rapport Concernant la Réalisation d'un Inventaire Bibliographique dans le Cadre du Programme de Conservation et d'Utilisation Rationnelle des Ecosystèmes Forestiers d'Afrique Centrale. Belgium: Laboratoire de Botanique, Université Libre de Bruxelles. 65 p.

Keywords: bibliography/conservation/ethnobotany/medicinal/medicinal plants

Notes: Subsections in this unannotated bibliography include nature conservation, ethnobotany, and medicinal plants. In addition, citations concerning NTFP's occur throughout the other sections.

van Harten, A.M. 1970. Melegueta Pepper. *Economic Botany*. 24(2): 208-216.

Keywords: Aframomum/bibliography/historical/melegueta/pest/trade

Abstract: Excerpted from the article: "This is an attempt to review our knowledge of *Melegueta Pepper*, at one time an important item in the West African trade. The literature is limited, especially in regard to publications presenting more than superficial botanical or historical data. There appears to be no information at all on such aspects as susceptibility to diseases, pests, etc. Some minor references have not been listed in the bibliography, and papers published prior to about 1850 have not been seen in original."

Vivien, J. and Faure, J.J. 1988. Wild fruit trees of Cameroon. *Apocynaceae. Fruits*. 43(7-8): 465-471.

Keywords: Apocynaceae/Cameroon/fruits/wild fruit

Notes: This reference was first located at www.ifcae.org/ntfp/.

Warren, D. M. and Pinkston, J. 1997. **Indigenous African Resource Management of a Tropical Rain Forest Ecosystem: A Case Study of the Yoruba of Ara, Nigeria.** Publisher: see note. 18 p.

Keywords: economic/indigenous knowledge/Nigeria

Abstract: Excerpted from page 1: "Learning Objectives for University-level Students

1. To explore social and cultural mechanisms for community management of an indigenous natural resource system, the semi-deciduous tropical rainforest of Ara, Nigeria.
2. To understand the role of indigenous knowledge decision-making, and experimentation in the maintenance of the natural resources of Ara, Nigeria.
3. To understand the relationship between biodiversity and cultural diversity as reflected in the indigenous knowledge of living things for the Yoruba community of Ara, Nigeria.

Case Study Materials:

"Objective 1: This case study explores the interactions between the social and ecological systems in the Nigerian semi-deciduous rainforest at Ara, Osun State, Nigeria. The traditional city-state of Ara includes the community of Ara and forty smaller towns and villages that are linked historically through their allegiance to the oba or king whose title is the Alara. This case looks at the changing indigenous agricultural and natural resource knowledge and decision-making systems. The local knowledge of the biological realm indicates that biodiversity has increased during the past half-century through the introduction of exotic tree and crop species as well as numerous new varieties of various arable crop species. This discovery is contrary to many other well documented case studies that support the scientific fact that biodiversity is in rapid decline in many parts of the globe."

Notes: From the title page: "Materials for this Teaching Module are from a Contribution to: Linking Social and Ecological Systems: Institutional Learning for Resilience. Fikret Berkes and Carl Folke, Editors. Cambridge: Cambridge University Press on behalf of The Property

Rights Program, The Beijer International Institute of Ecological Economics, The Royal Swedish Academy of Sciences. [*Expected publication in late 1997.*]"

Wibe, S. 1995. Non Wood Benefits in Forestry: A Survey of Valuation Studies. UN-ECE/FAO Timber and Forest Discussion Papers. ECE/TIM/DP/2. U; Geneva, Switzerland: Timber Section, Agriculture and Timber Division. 70 p.

Keywords: contingent valuation/existence value/hunting/option value/recreation/valuation

Notes: This report includes lengthy sections on nonmarket valuation techniques and how they are applied to recreation, hunting, and existence and option values. The report devotes over 40 pages to annotated descriptions of many past valuation studies.

Wicks, C.M.; Dalton, J.D.; and Macleod, H. 1986. Report on Preliminary Agricultural Survey of the Area around the Korup National Park in Cameroon. London: Bioresources. 28 p.

Keywords: *Baillonella toxisperma*/Cameroon/food/hunting/*Irvingia gabonensis*/national park/phytochemistry/*Poga/Poga oleosa*/production/*Sterculia oblonga*/toxisperma

Abstract: Excerpted from the Executive Summary: "Bioresources is working on the design of an agroforestry zone that will increase the production of food, cash and tree crops, livestock, wood fuel and building timber, around the Park thereby relieving pressure on it. It is hoped that this scheme can be made so attractive that the villagers that are currently inside the Park, or on the edge of it, will want to settle within the scheme.

"Objective

This project aims to teach people in the area how they can live in harmony with the forest without destroying it. As much of the forest as possible will be left intact in the resettlement areas. One objective is to obtain a maximum sustainable production of food and cash crops with a minimum destruction of forest. The Chagga tribe on Kilimanjaro and other African tribes have demonstrated that this is possible."

Notes: This report has as attached appendices survey results of food plants and minor forest products around Korup National Park. Species discussed are *Irvingia gabonensis*, *Poga oleosa*, *Baillonella toxisperma*, and *Sterculia oblonga*. An additional appendix discusses the phytochemistry of Korup's trees.

Wild, R.G. and Mutebi, J. 1996. Conservation through Community Use of Plant Resources: Establishing Collaborative Management of Bwindi Impenetrable and Mgahinga Gorilla National Parks, Uganda, In: People and Plants Working Paper. Semple, A. and Höft, R., eds. Paris: UNESCO. 5: 1-45.

Keywords: buffer zone/Bwindi/community groups/conservation/impacts/Mgahinga/monitoring/national park/parks/PRA/Uganda/website
Web/URL's: <http://www.rbgekew.org.uk/peopleplants/wp/index.html>

Notes: This paper can be ordered from the website indicated. It describes collaborative management where Uganda National Parks permitted use by local people of resources within two national parks. Park staff and community groups adjacent to the parks developed memoranda of understanding on implementation, enforcement, monitoring, and modification. Harvesting began in 1994. The authors write that it is too early to determine long-term impacts of the program, however, relations between local people and park staff have improved. While the focus of this paper is the process of developing comanagement, also included is discussion of, and data on, many NTFP's. The paper includes a good list of references.

Wilkie, D. S. and Carpenter, J.F. 1998. The Potential for Tourism Based Financing of Protected Areas in the Congo Basin. (In Review). Oryx.

Keywords: Congo/conservation/economic/ecotourism/growth/logging/national park/parks/tourism/website/croissance/parc

Web/URL's: ftp://carpe.gecp.virginia.edu/carpe/tourism_french.pdf

Abstract: FRENCH: Dans les états rentiers du bassin du Congo oppressés par dette et à forte croissance de la population, la conservation de la biodiversité n'est pas une priorité nationale. De plus les coûts d'exploitation des aires protégées et les coûts d'options dus à la non-exploitation du bois ou à l'absence d'agriculture dans ces zones constituent une perte nette importante pour les économies locales et nationales. En conséquence il est de plus en plus important que les aires protégées génèrent suffisamment de fonds par les droits d'entrée ou par des dons pour couvrir leurs coûts de maintenance. Les investissements des gouvernements et des donateurs couvrent actuellement moins de 30% des coûts d'exploitation estimés pour gérer efficacement le réseau d'aires protégées en Afrique Centrale, et ne couvrent pas les coûts d'options croissants. Le tourisme nature, secteur qui croît le plus rapidement dans une industrie de trois trillions de dollars par an pourrait être une source de revenus pour aider à combler ce gouffre financier.

Les parcs nationaux et les réserves du bassin du Congo abritent de nombreuses espèces uniques et attractives (okapi, gorille de plaine, mandrill, bongo, éléphant de forêt, etc.) qui pourraient attirer les touristes: de ce fait, de nombreux gestionnaires d'aires protégées engloutissent leurs capitaux dans le développement d'infrastructures touristique. Cet article étudie la capacité de l'écotourisme à générer des revenus pour la gestion des aires protégées et évalue sa viabilité financière dans le bassin du Congo.

ENGLISH: "In the debt ridden, high population growth, rentier states of the Congo Basin, conservation of biodiversity is not a national priority. Moreover, the recurring costs to manage protected areas and the opportunity costs of foregone logging and farming associated with maintaining protected areas constitute a substantial net drain on national and local economies. Consequently, it is becoming increasingly important that protected areas generate, directly from user fees or from donor contributions, funds sufficient to offset the costs of maintaining them. Government and donor investment presently meet less than 30 percent of the estimated recurring costs required to effectively manage the protected area network within central African countries, and they cover none of the growing opportunity costs. Nature tourism, the fastest growing sector of a \$3 trillion a year industry, may offer a source of revenue to help fill this financing gap. Congo Basin national parks and reserves harbor many unique and charismatic animals (okapi, lowland gorilla, drills, bongo, forest elephant, etc.) likely to attract tourists, and as a result many protected area managers are sinking capital into the development of tourist infrastructure. However, evidence from the region shows that with high infrastructure development costs, low tourist visitation rates, and continued political and military insecurity, the revenue generating capacity of tourism is marginal in the most well established and accessible sites with abundant and charismatic wildlife. Consequently, prospects for a viable tourist industry in more isolated, less well endowed protected areas in the Congo Basin are not encouraging. If ecotourism is distinguished from other forms of tourism in that it a) improves protected area management and b) provides economic benefits to local residents asked to forego resource use, then ecotourism in the Congo Basin fails to achieve the former and only marginally achieves the latter. At present, ecotourism in the Congo Basin is a net financial cost to protected area management. Even the intangible value of word of mouth advertising and advocacy by tourists is unlikely to stimulate donor contributions sufficient to offset the costs to develop tourist infrastructure in isolated protected areas in the region. Thus,

organizations should conduct more thorough financial and economic appraisals of the likely value of tourism {see example in IRG 1992 ID: 3505} before sinking scarce conservation funds into tourist infrastructure development that could be better spent elsewhere.

Notes: This 28-page report with references is available in French in pdf format on the CARPE website.

Wilkie, D.S. and Carpenter, J.F 1998. The Under-financing of Protected Areas in the Congo Basin: So Many Parks and So Little Willingness-To-Pay. (In Review). *Biological Conservation*.

Keywords: Congo/conservation/parks/website/parc

Web/URL's: http://carpe.gecp.virginia.edu/products/PA_theme_paper_abstracts2.asp

Abstract: ENGLISH: "Protected areas in the Congo Basin cover approximately six percent of the landscape, and several international NGO's are proposing substantial additions to the present network of parks and reserves. Yet, chronic underfunding has long precluded effective management of most parks and reserves resulting in their progressive ecological impoverishment and the loss of biodiversity. Furthermore, not only are the indebted nations of the Congo Basin not in a position to contribute significantly to cover the recurring costs of protected area management, the growing opportunity costs of setting aside protected areas is increasing the incentives to local communities and national governments to "illegally" exploit economically valuable resources within parks and reserves. If the global value of the biodiversity contained within the Congo Basin is considered worth preserving then donors and international NGO's must work with national governments to reach consensus on an optimal protected area network that a) contains a representative assemblage of forest species; b) is composed of forest blocks that are sufficiently large, intact, and likely to persist; c) contains zones of active speciation (for example, ecotones); and d) can expect to receive sufficient long-term financial support to ensure effective management.

"Given the "need to eat today" reality of economies in the Congo Basin, the international community must decide to shoulder most of the costs of conservation of globally important biodiversity. If donors continue to under-finance protected areas rather than make the hard choices associated with prioritizing protected area spending then most, if not all, protected areas within the Congo Basin will continue to exhibit reductions in the biomass of individual species, and risk the extirpation or

extinction of large, slow reproducing species, and rare endemics.”

FRENCH: Les aires protégées couvrent environ 6% du bassin du Congo et plusieurs ONG internationales ont proposé des ajouts substantiels au réseau actuel des parcs et réserves. Pourtant, le sous-financement chronique empêche depuis longtemps une gestion efficace des aires protégées, ce qui provoque leur appauvrissement écologique progressif et une perte de biodiversité. De plus, non seulement les pays endettés du bassin du Congo ne peuvent pas couvrir significativement les coûts d'exploitation des aires protégées, mais les dépenses croissantes occasionnées par le statut d'aire protégée incitent les communautés locales et les gouvernements nationaux à exploiter “illegalement” les ressources économiques dans les parcs et réserves. Si l'on considère que la valeur globale de la biodiversité du bassin du Congo doit être préservée, les donateurs et les ONG internationales doivent travailler avec les gouvernements pour arriver à un consensus sur un réseau optimal d'aires protégées qui a) englobe un assemblage représentatif d'espèces forestières, b) soit composé de blocs forestiers suffisamment étendus, intacts et pouvant persister, c) contienne des zones de spéciation active (par exemple des écotones) et d) puisse recevoir un financement à long terme suffisant pour assurer une gestion efficace. Etant donnée la réalité du “il-faut-manger-aujourd'hui” des systèmes économiques du bassin du Congo, la communauté internationale doit décider de supporter la majorité des coûts de la conservation d'une biodiversité globalement importante. Si l'on continue à sous-financer les aires protégées au lieu de prendre des décisions difficiles sur les priorités en matière de dépenses, alors la plupart, si ce n'est toutes les aires protégées, continueront à montrer des réductions de populations pour certaines espèces, et de grandes espèces à reproduction lente ou des endémiques rares risqueront de disparaître.

Notes: This 27-page report with references is available in French on the CARPE website (requires Adobe Acrobat reader to download).

Workshop Reader for Field Testing of the Socio-Economic Valuation of Non-timber Forest Products (NTFP's). 1998. Limbe, Cameroon. Amsterdam: AidEnvironment. 43 p.

Keywords: Cameroon/Limbe/valuation

Web/URL's: aidenvir@antenna.nl

Notes: This document gives a three page overview of capacity building for NTFP valuation in Cameroon. This is followed by a sample of NTFP valuation articles.

Yandji, E. 1999. Gestion Durable des Produits Forestiers Non Ligneux. Paper presented at Séminaire FORAFRI de Libreville - Session 3 Produits de la Forêts, 1999, at Libreville, Gabon. 10 p.

Keywords: CAR/conservation/Pygmées/RCA/femmes

Abstract: Le terme de produits forestiers non ligneux ou secondaires désigne tous les produits issus de la forêt à l'exception du bois. Aussi, le terme demeure incomplet si l'on n'y adjoint pas la conservation des sols, la protection des bassins versants, la conservation des ressources génétiques, végétales et animales et l'extraction minière.

Ainsi, cette contribution concerne la forêt située au sud-ouest de la RCA sur le PEA n° 163 attribué à la Société SESAM et la réserve spéciale de forêt dense de Dzanga-Sangha, au sud du permis.

La zone est habitée par les Pygmées Baka, les Mbimou et des allochtones travaillant dans les plantations de café - cacaoyer - palmier ou venus chercher du travail ou du diamant.

Pour se satisfaire, toutes ces populations tirent l'essentiel de la forêt, à savoir, la nourriture, les médicaments, le diamant et bien d'autres biens d'autoconsommation. Mal gérés, ces produits vont se raréfier ou disparaître et les Pygmées seront les premiers à ressentir les effets avant les autres partenaires car tributaires depuis l'origine des produits de la forêt.

Il conviendrait alors de faire un zonage assez représentatif des intérêts des différents partenaires, en essayant de connaître les règles de gestion locale et les potentialités économiques de ces produits non ligneux. Pour une gestion durable de ces produits forestiers non ligneux, il faudrait favoriser une prise de conscience et l'émergence de structures à caractère participatif et de programmes scolaires adaptés, l'information et l'alphabétisation des adultes, et en particulier des femmes.

L'enrichissement des jardins de case et des abords des villages en produits utiles forestiers, et l'amélioration des techniques culturelles viennent en support. Afin de ne pas léser de façon irréversible un intérêt ou un autre, un organisme non partisan - par exemple une ONG - devra assurer le suivi.

Notes: Publication date is estimated.

Yebade, T. 1973. Some Aspects of Developmental Physiology of the Nigerian Kola (*Cola nitida*) Fruit. *Economic Botany*. 27: 417-422.

Keywords: Cola/economic/fruits/growth/pharmaceutical/preservation/production/storage/trade/Nigeria

Abstract: "Systematic physiological studies were carried out on kola fruits from W1/6 plot at the Gambari Experimental Station, Ibadan, Nigeria. Pod growth in terms of weight, length, and diameter was followed from fruit-set to harvest maturity. Changes in percentage moisture content, starch, total, and reducing and nonreducing sugars of pod components were also followed at two-week intervals throughout the developmental period. Results indicated that physical growth of the kola fruit continues until harvest maturity. The moisture content at maturity was higher in the husk than in the nuts. Sugar content of the pod was maximal (54.7 mg glucose/gm tissue) at about the 10th week from fruit-set. Reducing sugars were present in higher concentrations than nonreducing sugars throughout the growth period and starch continued to accumulate mainly in the nuts with growth and development.

"Kola [*Cola nitida* (Vent.) Schott and Endl.] belongs to the genus *Cola* and is indigenous to tropical Africa. Of the over 40 species recorded in West Africa, *Cola nitida* and *C. acuminata* are of economic importance in Nigeria. The kola tree is cultivated mainly for its nuts, which contain some alkaloids (caffeine, theobromine, and kolanin). Because these alkaloids dispel sleep, thirst, and hunger, the nuts are used widely as a masticatory. A few hundred tons of the dried nuts are exported annually from West Africa to North America and Europe where they are used for beverages and pharmaceutical purposes.

"Nigeria is the world's largest producer of kola nuts with about 88 percent of the bulk of the *C. nitida* coming from the western State. (Quarcoo, 1969). It is estimated that the annual production increased from about 2,000 tons in 1910 to 110,000 tons in 1960 (Van Eijnatten, 1964). As kola is fast becoming important in the export trade of Nigeria, it is necessary that studies be carried out to increase our knowledge of its developmental physiology. Such knowledge may help in solving the pressing problems concerning long-term preservation without loss of quality as effective preservation of the nuts will be governed by stage of maturity at harvest, handling conditions, and duration of storage."

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Index of Acronyms

ADIE	Association pour le Développement de l'Information Environnementale
APFT	Avenir des Peuples des Forêts Tropicales (The Future of Tropical Rainforest Peoples)
ARRP	African Rattan Research Program
BDCP	Bioresources Development and Conservation Programme
CARPE	Central African Regional Programme for the Environment
CFA	Communauté Financière Africaine (Central African currency)
CIFOR	Center for International Forestry Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CUREF	Proyecto de Conservación y Utilización Racional de los Ecosistemas Forestales en Guinea Ecuatorial
ECOFAC	Conservation et Utilisation Rationnelle des Ecosystèmes Forestiers d'Afrique Centrale
FAO	Food and Agriculture Organization of the United Nations
ICBG	International Cooperative Biodiversity Group
ICRAF	International Centre for Research in Agroforestry
IIED	International Institute of Environment and Development
IR1	Intermediate Results 1 (for CARPE projects)
IRET	l'Institut de Recherche en Ecologie Tropicale
ITE	Institute of Terrestrial Ecology
IUCN	The World Conservation Union
MCP-GEF	Mount Cameroon Project- Global Environment Facility
NGO's	Nongovernmental Organization
NTFP's	Nontimber Forest Products
ORSTOM	Institut français de Recherche Scientifique pour le Développement en Coopération
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
WWF	World Wide Fund for Nature

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